

SERVICE MANUAL

Models

**RGX7100, 7800
GENERATORS**

PUB-GS6828
Rev. 07/09

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NOTE

This Service Manual excludes information for engine.

As for the total servicing information as a generator set, please refer in conjunction with the Robin EX35/40 OHC Engine Service Manual.

1. SPECIFICATIONS

MODEL				RGX7100		RGX7800			
Generator	Type			Brush, self-exciting, 2-poles, single phase					
	Voltage regulating system			AVR type					
	AC Output								
	Rated voltage	V	50Hz	220, 240					
			60Hz	120 / 240					
	Rated current	A	50Hz	20.9, 19.2		25, 22.9			
			60Hz	41.7 / 20.8		50 / 25			
	Rated output	VA (W)	50Hz	4600		5500			
			60Hz	5000		6000			
	Rated power factor			1.0					
	Safety device type			Fuse-less circuit breaker					
	DC Output								
	Rated voltage	V	12						
			8.3						
Rated current			A						
Safety device type			Fuse-less circuit breaker						
Engine	Model			EX35D		EX40D			
	Type			ROBIN, Air-cooled, 4-stroke, OHC, Gasoline Engine					
	Displacement			mL					
	Fuel			Automotive Unleaded Gasoline					
	Fuel tank capacity			L					
	Engine oil capacity			L					
	Spark plug			BR-6HS (NGK)					
	Starting system			Electric starter / Recoil					
Direction of rotation				Counter - clockwise					
Dimension	Length			mm					
	Width			mm					
	Height			mm					
Dry weight				kg		86(96)*3		88(98)*3	

Specifications are subject to change without notice.

*1: () shows the filled amount up to the "LEVEL" position.

*2: () shows dimensions with Battery frame.

*3: () shows dry weight with Electric starter.

2. PERFORMANCE CURVES

•RGX7100

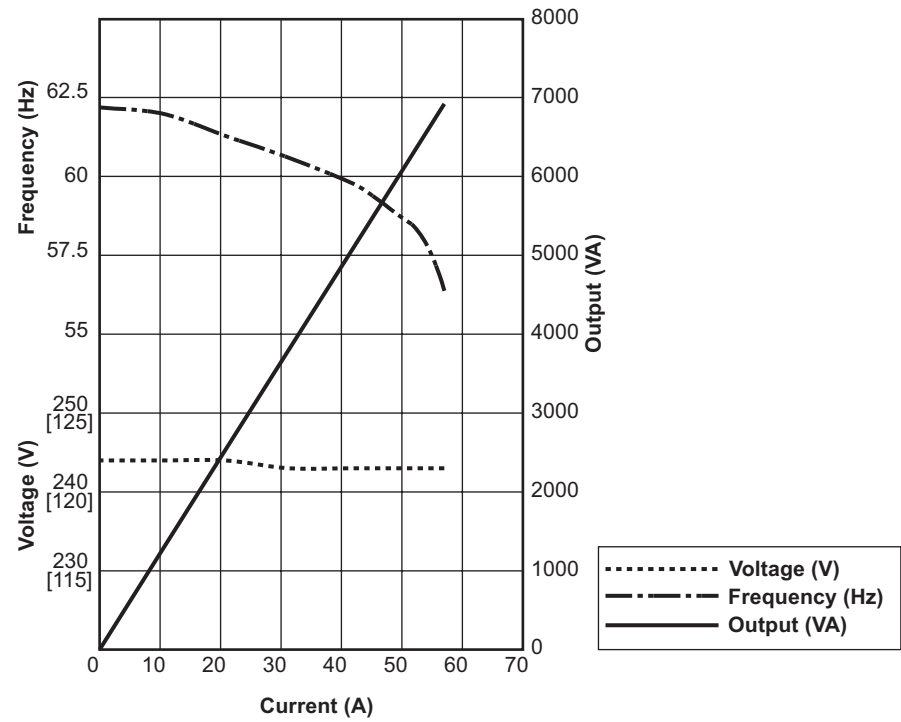
50Hz-220V

N / A

50Hz-240V

N / A

60Hz-120/240V



•RGX7800

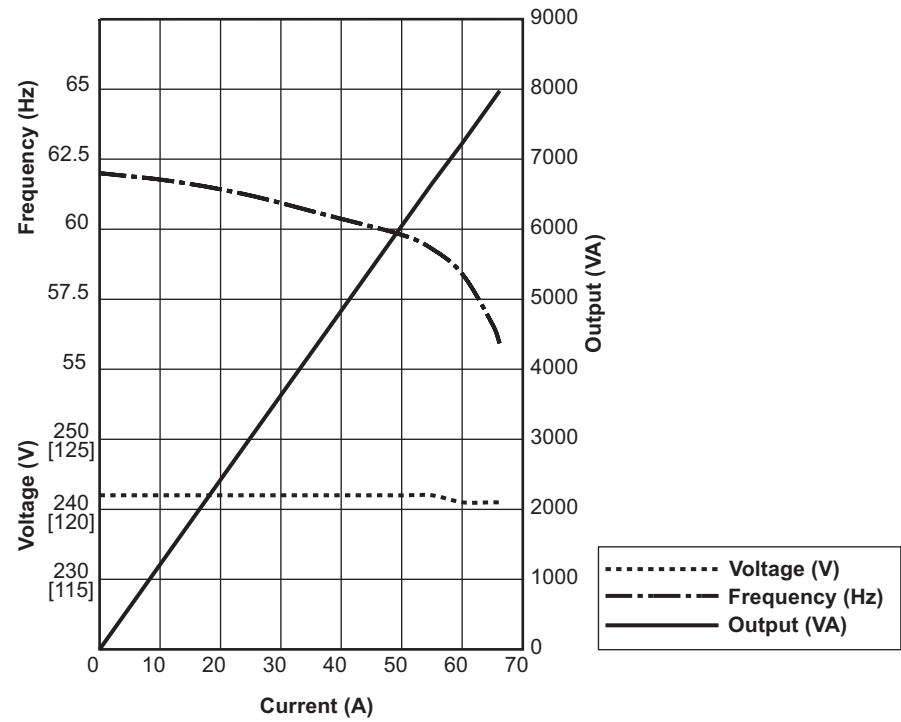
50Hz-220V

N / A

50Hz-240V

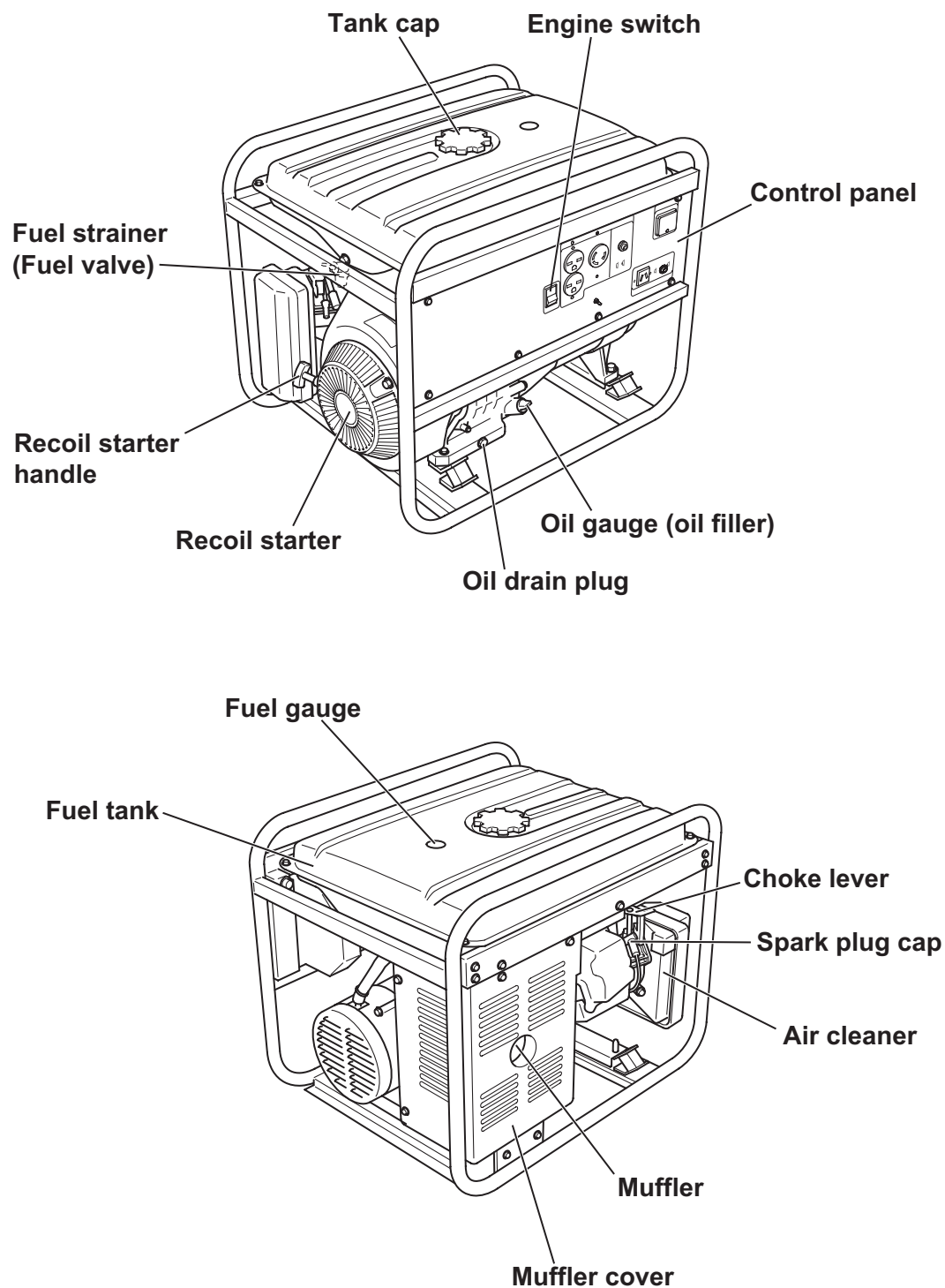
N / A

60Hz-120/240V



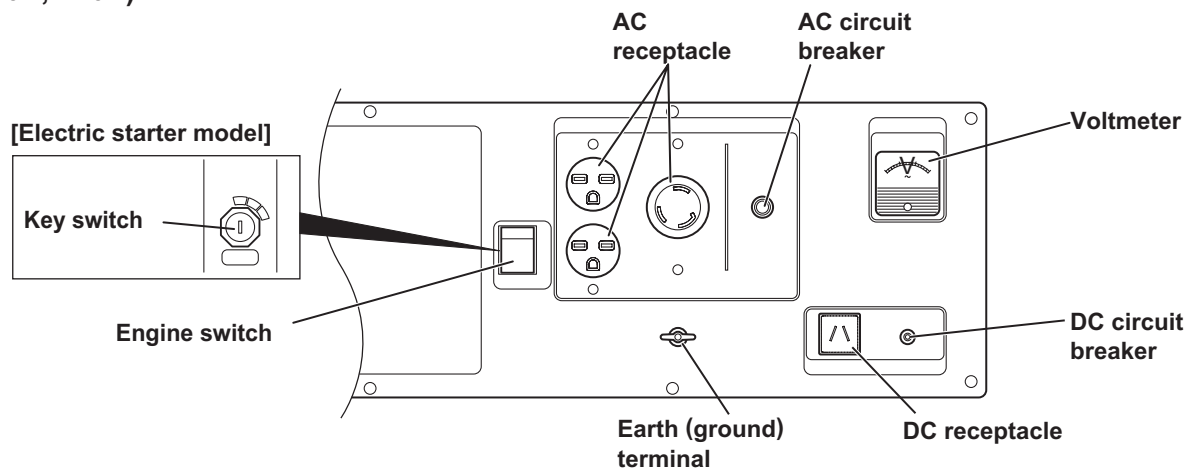
3. GENERAL DESCRIPTION

RGX7100, RGX7800

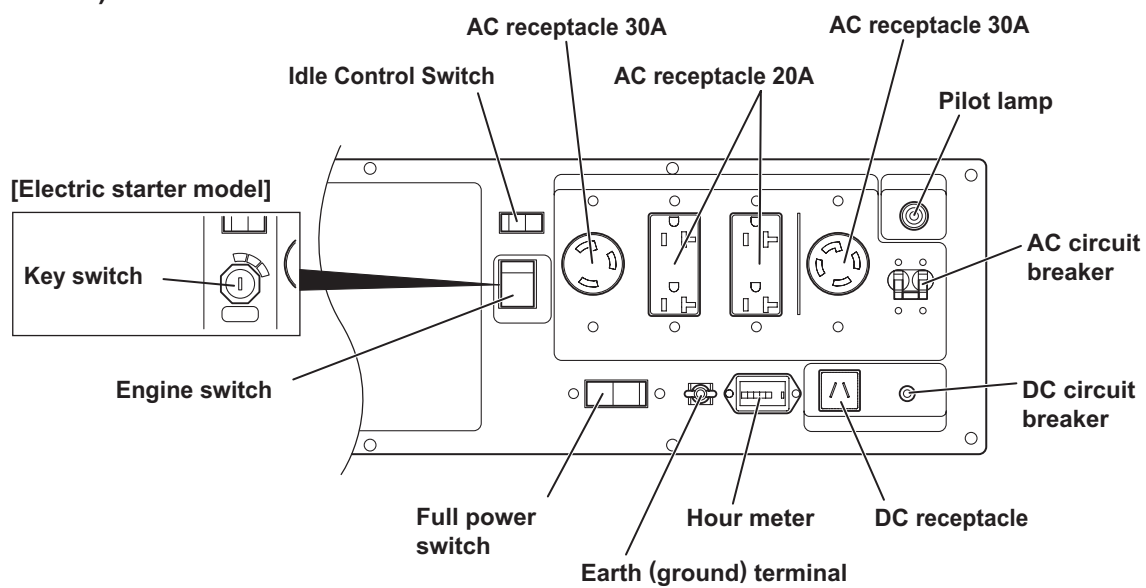


CONTROL PANEL

(50Hz-220V, 240V)



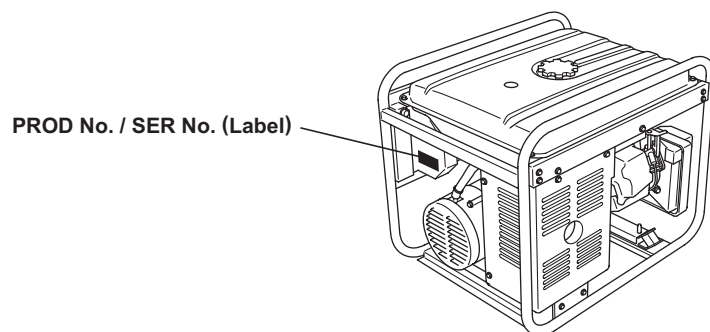
(60Hz-120/240V)



SERIAL NUMBER

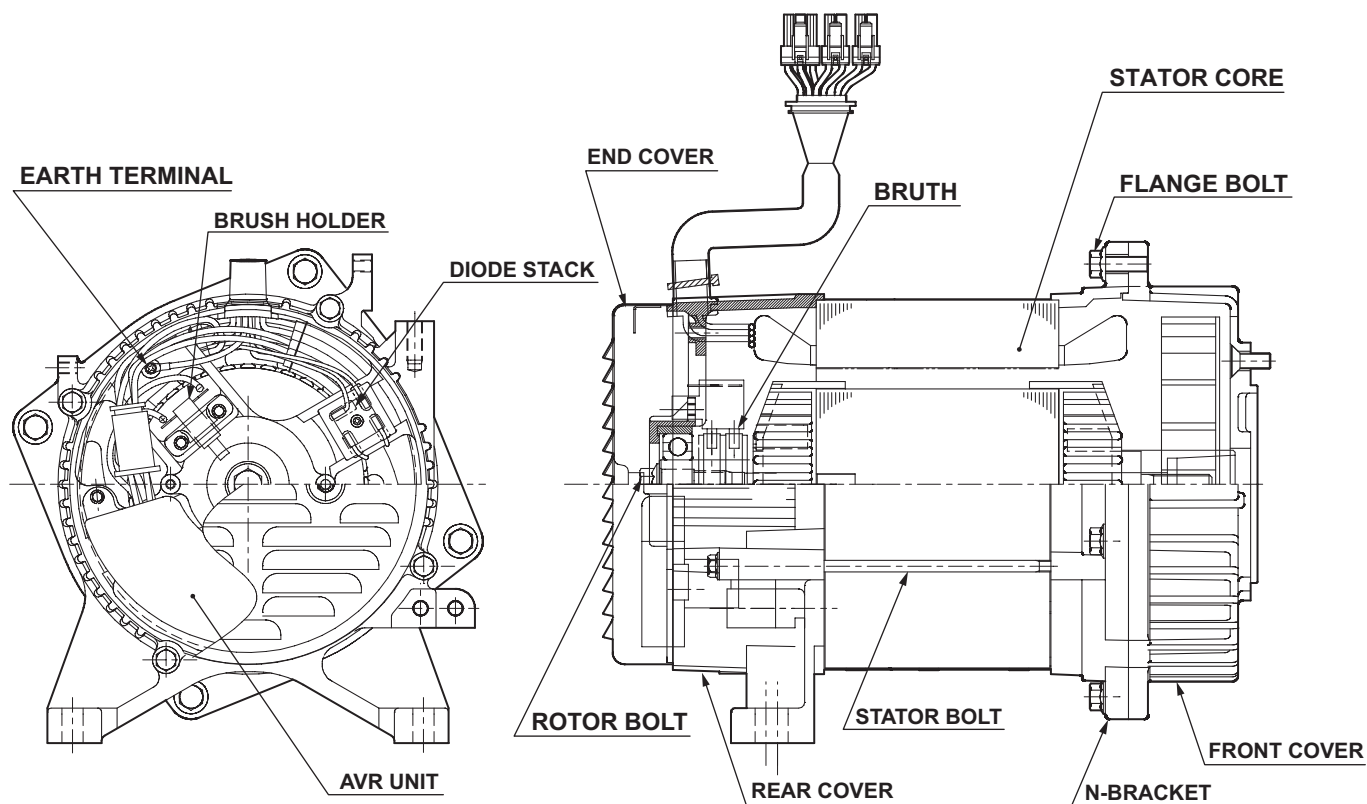
Serial number is stamped on the label stuck on the control box.

NOTE : Always specify serial number when inquiring about the generator or ordering spare parts in order to get correct parts and accurate service.



CONSTRUCTION

•RGX7100 / RGX7800



4. RANGE OF APPLICATIONS

Generally, the power rating of an electrical appliance indicates the amount of work that can be done by it. The electric power required for operating an electrical appliance is not always equal to the output wattage of the appliance. The electrical appliances generally have a label showing their rated voltage, frequency, and power consumption (input wattage). The power consumption of an electrical appliance is the power necessary for using it. When using a generator for operating an electrical appliance, the power factor and starting wattage must be taken into consideration.

In order to determine the right size generator, it is necessary to add the total wattage of all appliances to be connected to the unit.

Refer to the followings to calculate the power consumption of each appliance or equipment by its type.

(1) Incandescent lamp, heater, etc. with a power factor of 1.0

Total power consumption must be equal to or less than the rated output of the generator.

Example : A rated 3000W generator can turn thirty 100W incandescent lamps on.

(2) Fluorescent lamps, motor driven tools, light electrical appliances, etc. with a smaller power factor

Select a generator with a rated output equivalent to 1.2 to 2 times of the power consumption of the load. Generally the starting wattage of motor driven tools and light electrical appliances are 1.2 to 3 times larger than their running wattage.

Example: A rated 250 W electric drill requires a 400 W generator to start it.

NOTE 1: If a power factor correction capacitor is not applied to the fluorescent lamp, the more power shall be required to drive the lamps.

NOTE 2: Nominal wattage of the fluorescent lamp generally indicates the output wattage of the lamp. Therefore, if the fluorescent lamp has no special indication as to the power consumption, efficiency should be taken into account as explained in Item (5) on the following page.

(3) Mercury lamps with a smaller power factor

Loads for mercury lamps require 2 to 3 times the indicated wattage during start-up.

Example : A 400 W mercury lamp requires 800 W to 1200 W power source to be turned on. A rated 3000 W generator can power two or three 400 W mercury lamps.

(4) Initially loaded motor driven appliances such as water pumps, compressors, etc.

These appliances require large starting wattage which is 3 to 5 times of running wattage.

Example : A rated 900 W compressor requires a 4500 W generator to drive it.

NOTE 1: Motor-driven appliances require the aforementioned generator output only at the starting. Once their motors are started, the appliances consume about 1.2 to 2 times their rated power consumption so that the excess power generated by the generator can be used for other electrical appliances.

NOTE 2 : Motor-driven appliances mentioned in items (3) and (4) vary in their required motor starting power depending on the kind of motor and start-up load. If it is difficult to determine the optimum generator capacity, select a generator with a larger capacity.

(5) Appliances without any indication as to power consumption

Some appliances have no indication as to power consumption; but instead the work load (output) is indicated. In such a case, power consumption is to be worked out according to the numerical formula mentioned below.

$$\frac{(\text{Output of electrical appliance})}{(\text{Efficiency})} = (\text{Power consumption})$$

Efficiencies of some electrical appliances are as follows :

Single-phase motor 0.6 to 0.75

Fluorescent lamp 0.7 to 0.8

(The smaller the motor, the
lower the efficiency.)

Example 1 : A 40W fluorescent lamp means that its luminous output is 40W. Its efficiency is 0.7 and accordingly, power consumption will be $40 \div 0.7 = 57\text{W}$. As explained in Item (2), multiply this power consumption value of 57 W by 1.2 to 2 and you will get the figure of the necessary capacity of a generator. In other words, a generator with a rated output of 1000W capacity can light nine to fourteen 40 W fluorescent lamps.

Example 2 : Generally speaking, a 400 W motor means that its work load is 400 W. Efficiency of this motor is 0.7 and power consumption will be $400 \div 0.7 = 570\text{ W}$. When this motor is used for a motor-driven tool, the capacity of the generator should be multiple of 570 W by 1.2 to 3 as explained in the Item (3). $570\text{ (W)} \times 1.2\text{ to }3 = 684\text{ (W) to }1710\text{ (W)}$

Applications	Applicable Wattage(approx. W)			
	50Hz		60Hz	
	RGX7100	RGX7800	RGX7100	RGX7800
Incandescent lamp, Heater	4600	5500	5000	6000
Fluorescent lamp, Electric tool	2550	3000	2750	3300
Mercury lamp	1850	2200	2000	2400
Pump, Compressor	1150	1350	1250	1500

Table. 4-1

NOTES : Wiring between generator and electrical appliances

1. Allowable current of cable

Use a cable with an allowable current that is higher than the rated input current of the load (electrical appliance). If the input current is higher than the allowable current of the cable used, the cable will become excessively heated and deteriorate the insulation, possibly burning it out. Table 4-2 shows cables and their allowable currents for your reference.

2. Cable length

If a long cable is used, a voltage drop occurs due to the increased resistance in the conductors decreasing the input voltage to the load (electrical product). As a result, the load can be damaged. Table 4-2 shows voltage drops per 100 meters of cable.

Nominal cross section	A.W.G.	Allowable current	No.of strands / strands dia.	Resistance	Current Amp.							Voltage drop
mm ²	No.	A	No./mm	Ω/100m	1A	3A	5A	8A	10A	12A	15A	
0.75	18	7	30/0.18	2.477	2.5V	7.5V	12.5V	—	—	—	—	Voltage drop
1.25	16	12	50/0.16	1.486	1.5V	4.5V	7.5V	12V	15V	18V	—	
2.0	14	17	37/0.26	0.952	1V	3V	5V	8V	10V	12V	15V	
3.5	12 to 10	23	45/0.32	0.517	—	1.5V	2.5V	4V	5V	6.5V	7.5V	
5.5	10 to 8	35	70/0.32	0.332	—	1V	2V	2.5V	3.5V	4V	5V	

Table. 4-2

Voltage drop indicates as $V = \frac{1}{100} \times R \times I \times L$

R means resistance (Ω/100 m) on the above table.

I means electric current through the wire (A).

L means the length of the wire (m).

The length of wire indicates round length, it means twice the length from generator to electrical tools.

5. MEASURING PROCEDURES

5-1 MEASURING INSTRUMENTS

(1) VOLTMETER

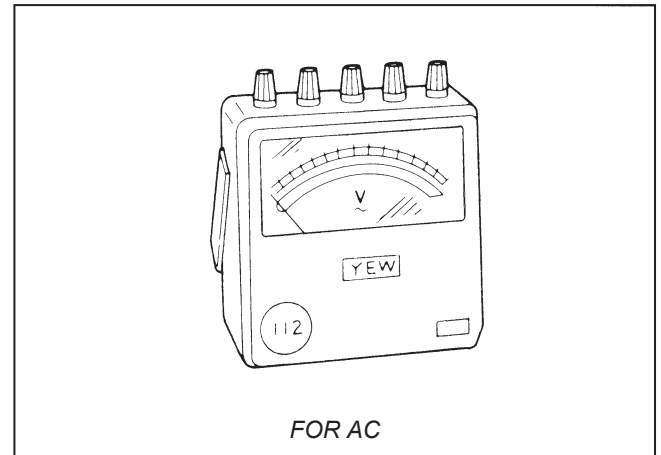
AC voltmeter is necessary.

The approximate AC voltage ranges of the voltmeters to be used for various types of generators are as follows :

0 to 150 V : Type with an output voltage of 110 or 120 V

0 to 300 V : Type with an output voltage of 220, 230 or 240 V

0 to 150 V, 0 to 300 V : Dual voltage type

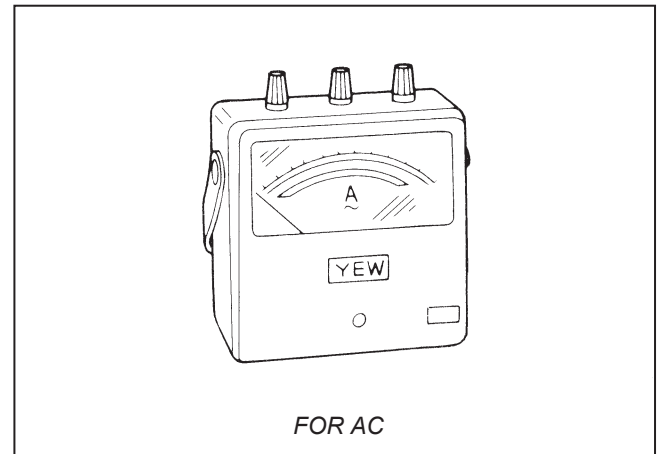


(2) AMMETER

AC ammeter is necessary.

An AC ammeter with a range that can be changed according to the current rating of a given generator is most desirable.

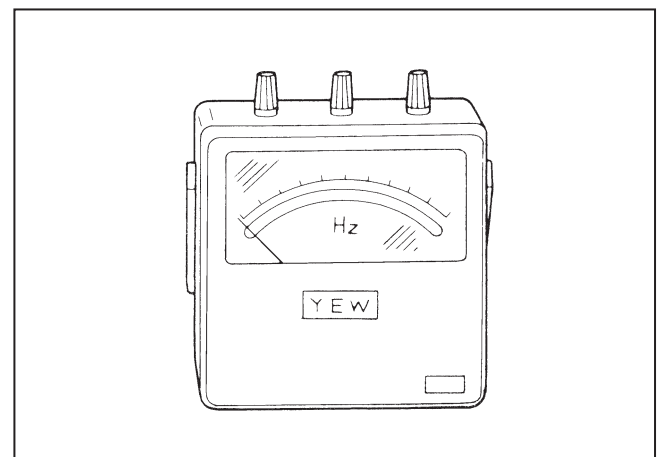
(About 10 A, 20 A, 100 A)



(3) FREQUENCY METER

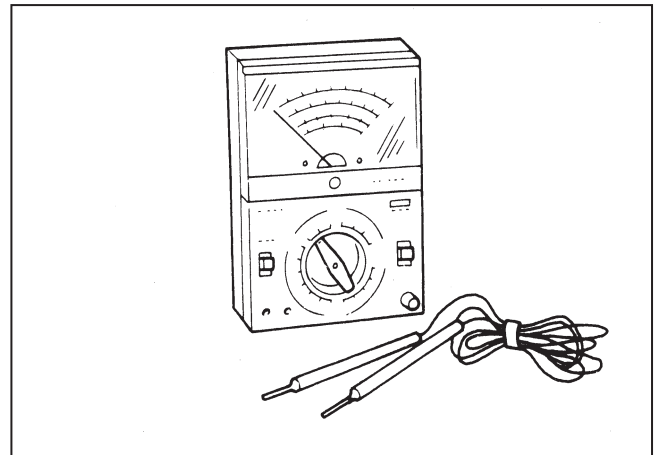
Frequency range : About 45 to 65Hz

NOTE : Be careful of the frequency meter's input voltage range.



(4) CIRCUIT TESTER

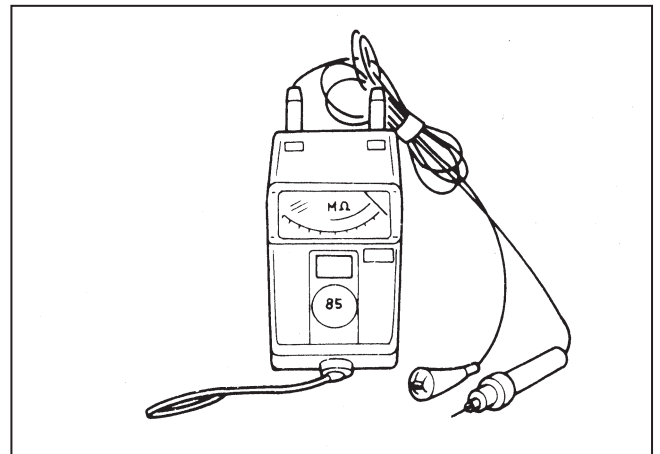
Used for measuring resistance, etc.



(5) MEGGER TESTER

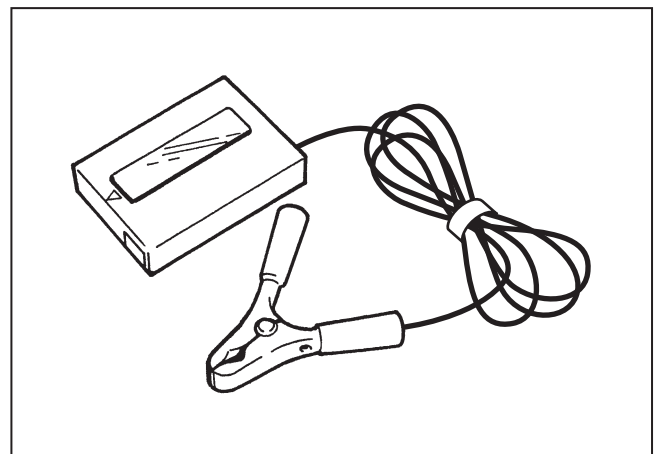
Used for measuring generator insulation resistance.

Select one with testing voltage range of 500V.

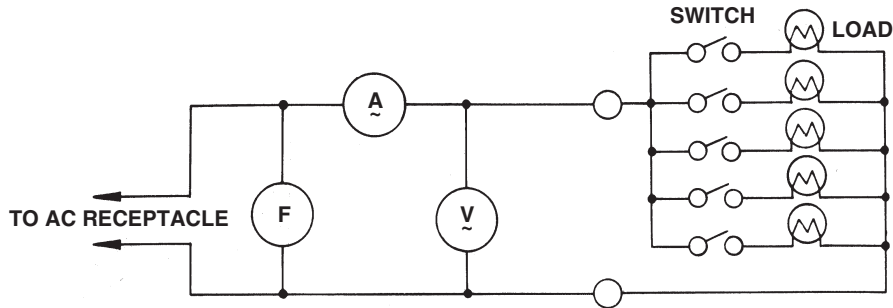


(6) TACHOMETER

Use the contactless type tacho meter.



5-2 AC OUTPUT MEASURING

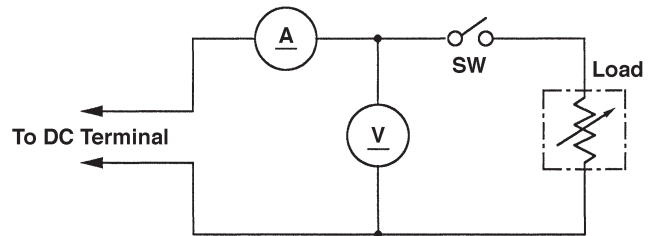


Use a circuit above for measuring AC output. A hot plate or lamp with a power factor of 1.0 may be used as a load. Adjust the load and rpm. and check that the voltage range is as specified in the following table at the rated amperage and rated rpm.

Model	Hz	Rated voltage			Voltage range
		120V	220V	240V	
RGX7100	50	—	219 - 228	239 - 248	
	60	118 - 127	219 - 228	239 - 248	
RGX7800	50	—	219 - 228	239 - 248	
	60	118 - 127	219 - 228	239 - 248	

5-3 DC OUTPUT MEASURING

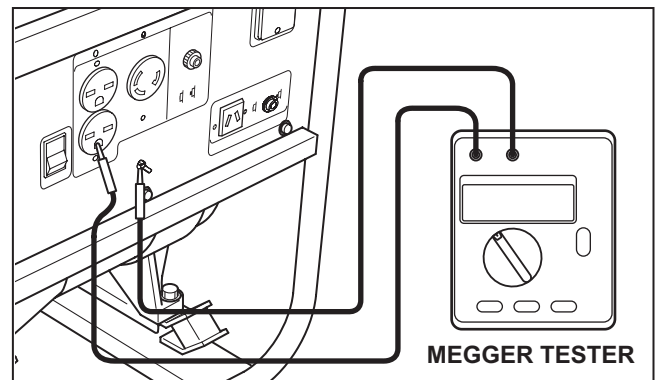
Measurement of DC output is executed with the switch turned ON while the current is regulated at 8.3A by adjusting the load to the generator. If the voltage is within the range from 10V, the voltage output is normal.



NOTE : If a battery is connected as a load to the generator, the DC output voltage will increase by approximately 1 to 2 V. Therefore, carefully observe the electrolyte level and do not overcharge the battery.

5-4 MEASURING INSULATION RESISTANCE

Use a megger tester to check the insulation resistance. Remove the control panel, and disconnect the connector of GREEN lead for ground. Connect a megger tester to one of receptacle output terminals and the ground terminal, then measure the insulation resistance.



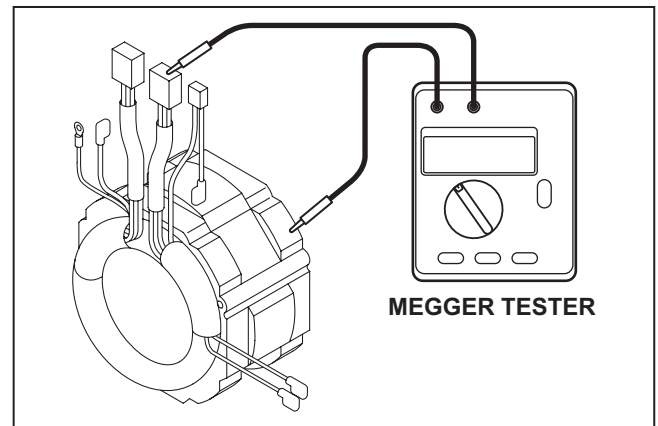
An insulation resistance of 1 megohm or more is normal.

(The original insulation resistance at the time of shipment from the factory is 10 megohm or more.)

If it is less than 1 megohm, disassemble the generator and measure the insulation resistance of the stator, rotor and control panel individually.

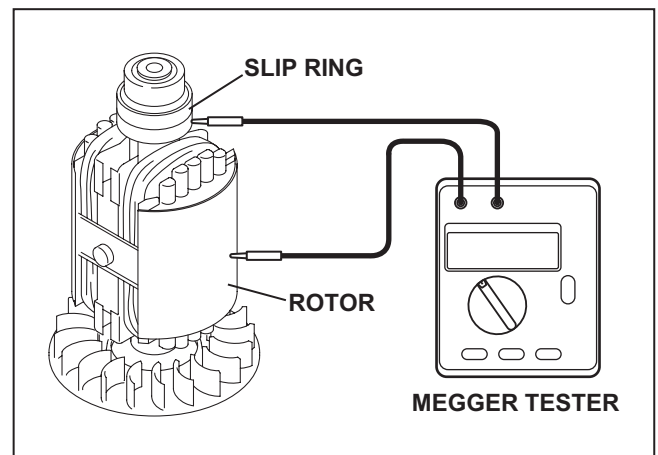
(1) STATOR

Measure the insulation resistance between each lead wire and the core.



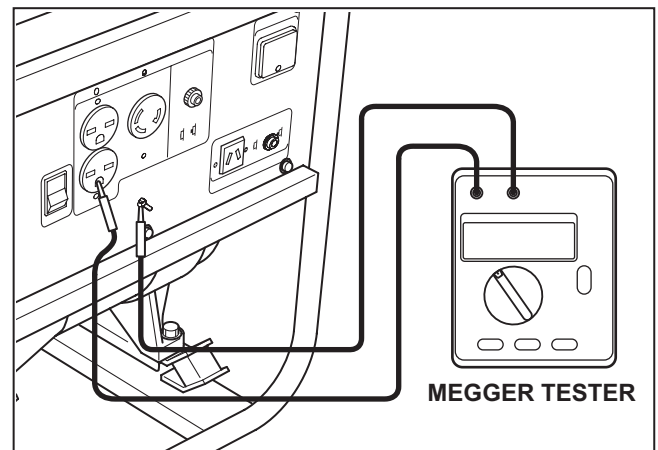
(2) ROTOR

Measure the insulation resistance between the slip ring and the core.



(3) CONTROL PANEL

Measure the insulation resistance between the live parts and the grounded parts.



Any part where the insulation resistance is less than 1MΩ has faulty insulation, and may cause electric leakage and electric shock.

Replace the faulty part.

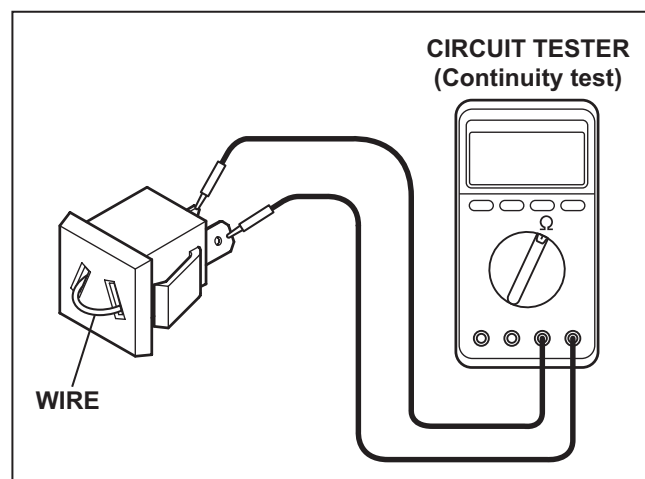
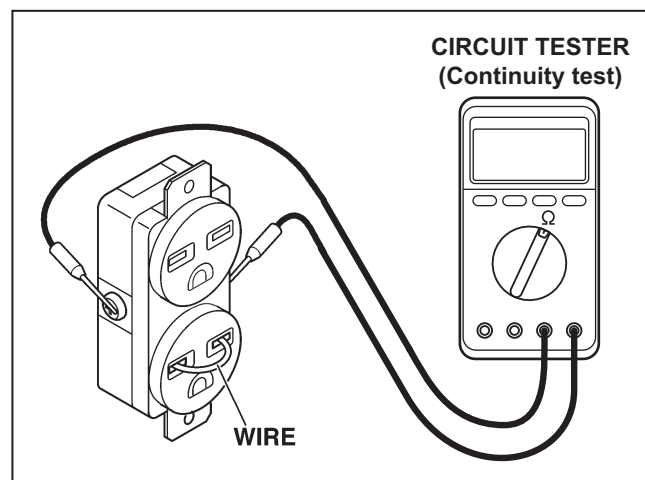
6. CHECKING FUNCTIONAL MEMBERS

6-1 RECEPTACLES

Using a circuit tester, check continuity between the two terminals at the rear of the receptacles while the receptacle is mounted on the control panel.

When continuity is found between the output terminals of the receptacle with a wire connected across these terminals, the receptacle is normal.

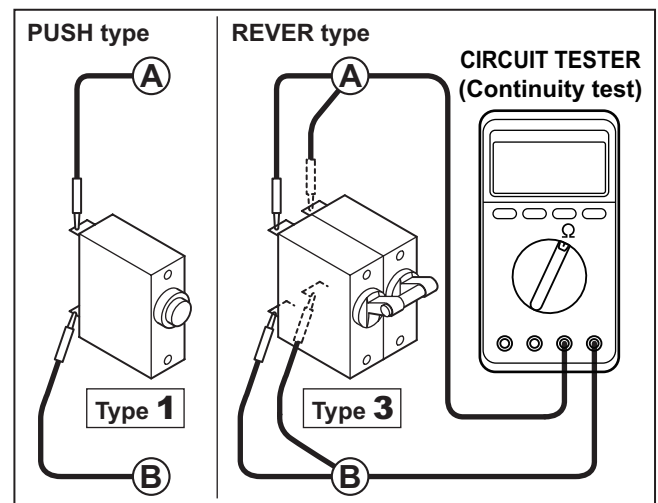
When the wire is removed and no continuity is found between these terminals, the receptacles are also normal.



6-2 CIRCUIT BREAKER

Check continuity between each of two terminals at the rear of the circuit breaker while it is mounted on the control panel.

Normally, there is continuity between each of the two when the circuit breaker is on while there is no continuity when the circuit breaker is off.



•AC CIRCUIT BREAKER

Model	Frequency	Rated output	Rated voltage	Rated fault current	Type
RGX7100	50Hz	4600VA	220V	20	1
			240V	N / A	1
	60Hz	5000VA	120/240V	23	3
RGX7800	50Hz	5500VA	220V	N / A	1
			240V	N / A	1
	60Hz	6000VA	120/240V	28	3

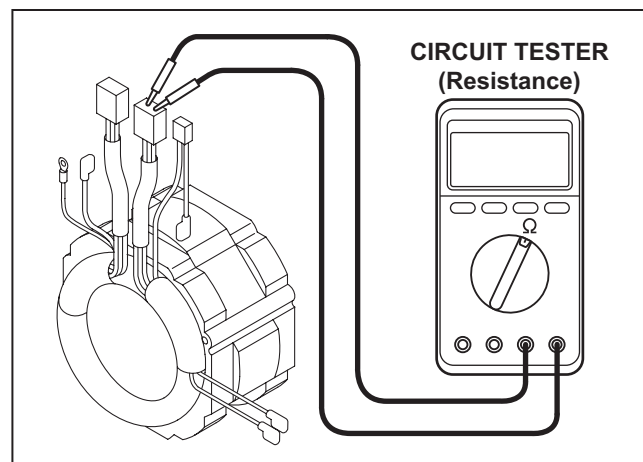
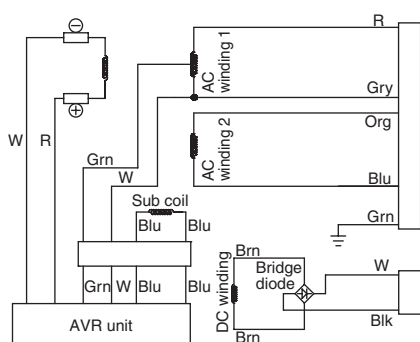
•DC CIRCUIT BREAKER

Model	Rated current	Rated voltage	Rated fault current	Type
RGX7100 RGX7800	8.3A	12V	10A	1

6-3 STATOR

Disengage connectors on the wires from stator and check the resistance between wires with a circuit tester referring to the following table.

NOTE : If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings. Erroneous readings will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from 20 °C (68 °F).



•RGX7100

(Ω)

FREQUENCY		50Hz		60Hz
RATED VOLTAGE		220V	240V	120/240V
AC WINDING 1	RED - GRAY	0.56	0.69	0.60
AC WINDING 2	ORANGE - BLUE	0.56	0.69	0.60
SUB COIL	BLUE - BLUE	1.64	1.74	1.53
DC WINDING	BROWN - BROWN	0.12	0.13	0.10
AC WINDING 1	GREEN - WHITE	0.10	0.12	0.10

•RGX7800

(Ω)

FREQUENCY		50Hz		60Hz
RATED VOLTAGE		220V	240V	120/240V
AC WINDING 1	RED - GRAY	0.59	0.64	0.41
AC WINDING 2	ORANGE - BLUE	0.59	0.64	0.41
SUB COIL	BLUE - BLUE	1.80	1.76	1.35
DC WINDING	BROWN - BROWN	0.13	0.10	0.09
AC WINDING 1	GREEN - WHITE	0.10	0.11	0.07

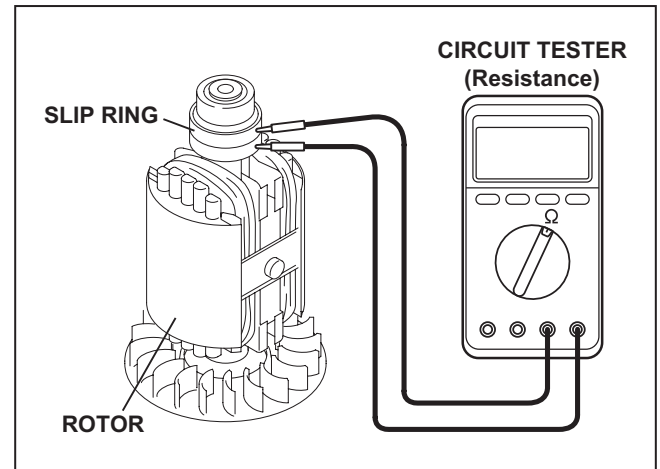
6-4 ROTOR ASSEMBLY

1) Field coil

Remove the brush holder and measure resistance between the slip rings.

Rotor (Slip ring)	50Hz		60Hz
	220V	240V	120/240V
RGX7100	49.0	49.0	49.0
RGX7800	55.0	55.0	55.0

(Ω)

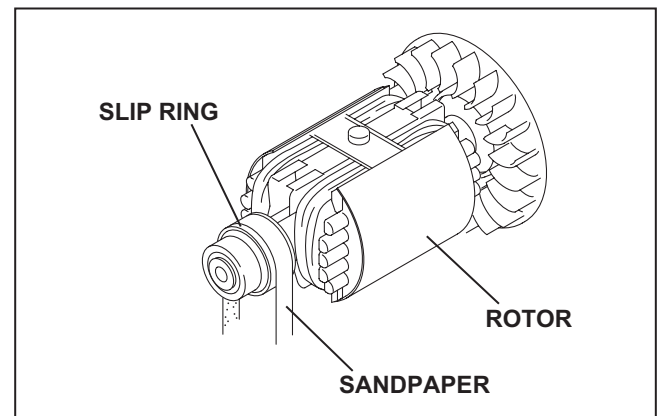


NOTE : If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings.

Erroneous reading will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from 20°C (68°F).

2) Cleaning Slip rings

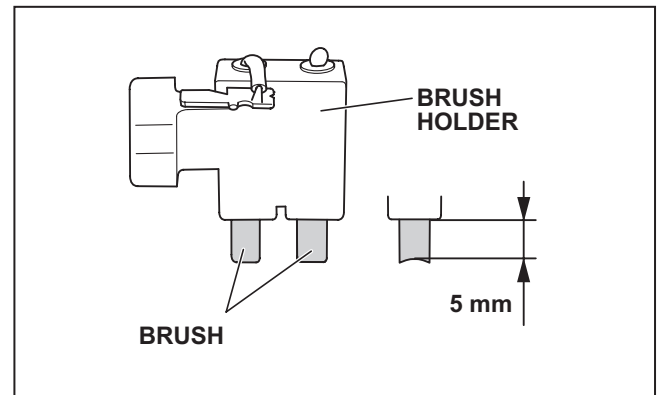
The slip ring surfaces must be uniformly bright. Slip rings showing black spots, excessive wear, or uneven wear must be repaired. A stained slip ring lowers generator efficiency and output voltage. Polish the slip rings with fine sandpaper while turning the rotor until rough spots disappear. Care should be taken not to touch the rotor coils with the sandpaper.



6-5 BRUSH

The brushes must be smooth where they contact the slip rings. If not, polish smooth the brushes with sandpaper. A brush that is not smooth produces arcs between the brush and slip ring leading to possible damage. Usable brush lengths are from 5 mm to 11 mm (0.20 " to 0.43").

A brush shorter than 5 mm must be replaced because decreased contact pressure between the brush and slip ring lowers generator efficiency and output voltage.

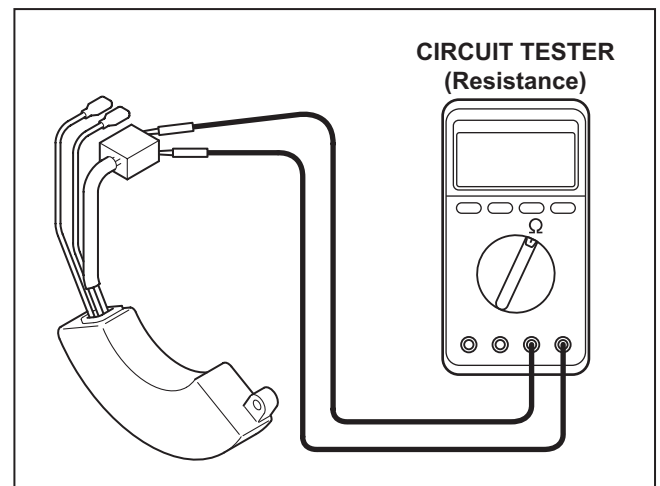


6-6 A.V.R. (AUTOMATIC VOLTAGE REGULATOR)

1) Features

This A.V.R. operates to control the field current in order to maintain the output voltage for the AC current, which generated by the magnetic flux by the field coil.

2) A.V.R. trouble may be identified by simply looking at the A.V.R., or by the inter-lead resistance with a tester, or actually mounting it in the generator and operating it.



(a) A.V.R. TROUBLE IDENTIFICATION by APPEARANCE

If an A.V.R. electronic part is burnt dark, or the surface epoxy resin melted, it often indicates A.V.R. trouble.

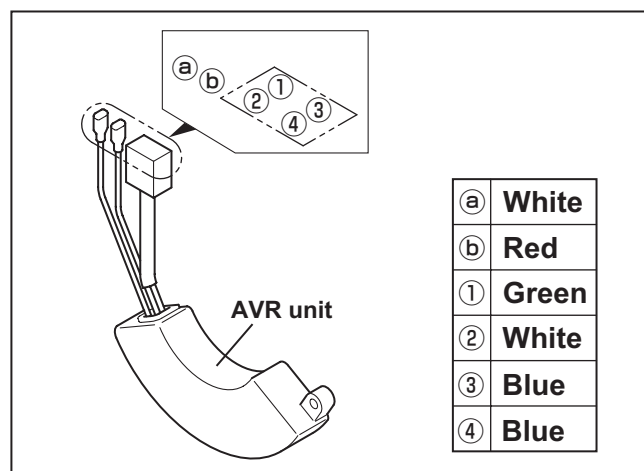
(b) IDENTIFYING A.V.R. TROUBLE by CHECKING INTER-LEAD RESISTANCE

Check the inter-lead resistance of the A.V.R. with a tester, referring to the following table. If the tester readings vary greatly from the values specified in the table on next page, the A.V.R. is faulty.

NOTE : Take tester inaccuracy into account in reading the tester.

(c) IDENTIFYING A.V.R. TROUBLE by
MOUNTING and OPERATING in THE
GENERATOR

SCR or transistor damage cannot be detected by simply looking at the A.V.R. or checking the lead resistance.
Check it by mounting the suspectedly faulty A.V.R. in a normal generator, or mount a normal A.V.R. in a generator which fails to generate voltage.



* Checking table for analogue circuit tester.

RGX7100 / RGX7800

(Ω) (R±20%)

		Apply black ⊖ needle of the circuit tester					
		White Ⓐ	Red Ⓑ	Green ①	White ②	Blue ③	Blue ④
Apply red ⊕ needle of the circuit tester	White Ⓐ	—	2.1M	5.0M	5.1M	4.6M	4.2M
	Red Ⓑ	1.8M	—	2.1M	2.1M	1.9M	1.6M
	Green ①	4.4M	2.0M	—	4.9M	4.4M	4.1M
	White ②	4.6M	2.1M	5.1M	—	4.6M	4.2M
	Blue ③	4.0M	1.7M	4.5M	4.5M	—	3.8M
	Blue ④	4.2M	1.8M	4.7M	4.7M	4.2M	—

6-7 DIODE STACK

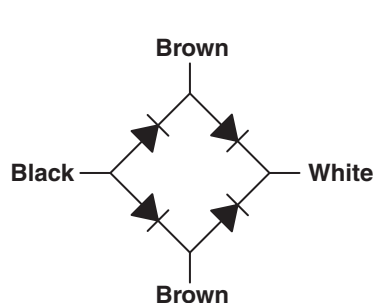


Fig.6-8a

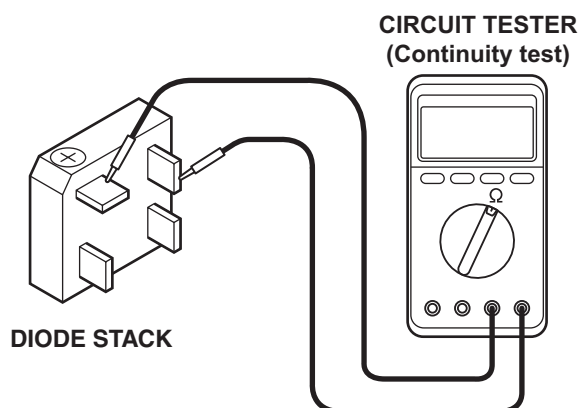
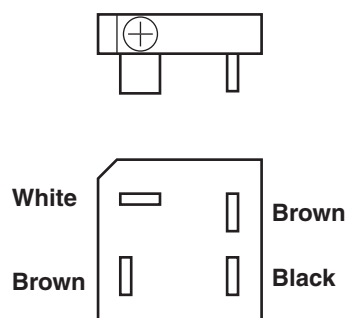


Fig.6-8b

Circuit inside of the diode stack is as shown in Fig.6-8a.

Check continuity between each terminal by using a circuit tester as shown in Fig.6-8b.

The diode stack is normal when continuity is as follows:

* Checking table for analogue circuit tester.

Analogue circuit tester		Apply black \ominus needle of the circuit tester			
		Brown	Brown	White	Black
Apply red \oplus needle of the circuit tester	Brown	—	No continuity	Continuity	No continuity
	Brown	No continuity	—	Continuity	No continuity
	White	No continuity	No continuity	—	No continuity
	Black	Continuity	Continuity	Continuity	—

* Checking table for digital circuit tester.

Digital circuit tester		Apply red \oplus needle of the circuit tester			
		Brown	Brown	White	Black
Apply black \ominus needle of the circuit tester	Brown	—	No continuity	Continuity	No continuity
	Brown	No continuity	—	Continuity	No continuity
	White	No continuity	No continuity	—	No continuity
	Black	Continuity	Continuity	Continuity	—

NOTE 1 : In checking the diode , direction of connection is contrary to the ordinary case because of characteristics of the diode and battery incorporated in the tester.

NOTE 2 : "Continuity" means forward direction characteristics of the diode, and different from short circuit condition (In which a pointer of the tester goes out of its normal scale), shows resistance to some extent. When results of the checking indicates failure even in one section, replace with a new one.

6-8 OIL SENSOR

- (1) Disconnect wires coming from the sensor at the connection.
- (2) Loosen the sensor to remove it from the engine.
- (3) Plug the opening of oil filler hole (created after sensor is removed) with suitable means such as oil gauge.
- (4) Connect the removed wires again with the oil sensor.
- (5) Start the engine with the oil sensor removed and confirm if ;
 - a. Engine stops after 5 seconds which is normal, or
 - b. Engine does not stop after more than 10 seconds which is unusual.

NOTE : *The sensor will not operate properly when wire is broken or poorly connected.
Check the wires for correct connection. If it fails to stop within 5 seconds after the wirings have checked, the sensor is wrong. Replace the sensor with new one.*

6-8-1 SPECIFICATIONS

Type	Float type (with lead switch incorporated)
Resistance (at FULL oil level)	100 M ohms or over
Operating Temperature	-30 to +180 degree Celsius

6-8-2 CONSTRUCTION AND OPERATION

Disconnect wires coming from the sensor The oil sensor is composed of the float, permanent magnet incorporated into the float and the oil sensor.

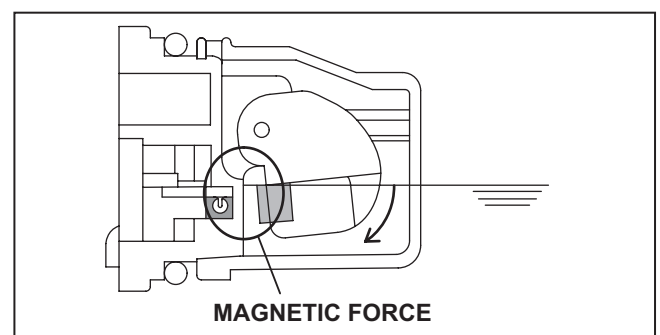
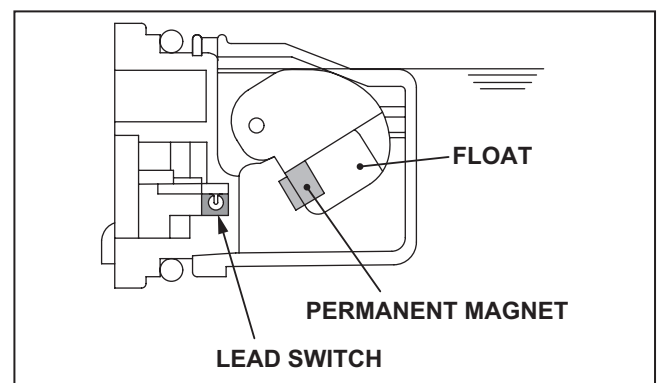
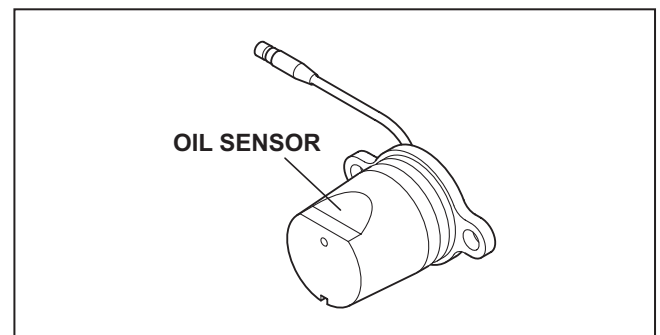
In accordance with the oil level, the float moves up and down.

When the oil level is upper level, the float moves up.

When the oil level is lower level, the float moves down.

The permanent magnet is close to the lead switch, and the lead switch is activated by the magnetic force.

NOTE : *With regards to the wiring diagram, please refer to the section 9 (page46).*



6-9 IDLE CONTROL (OPTIONAL EQUIPMENT)

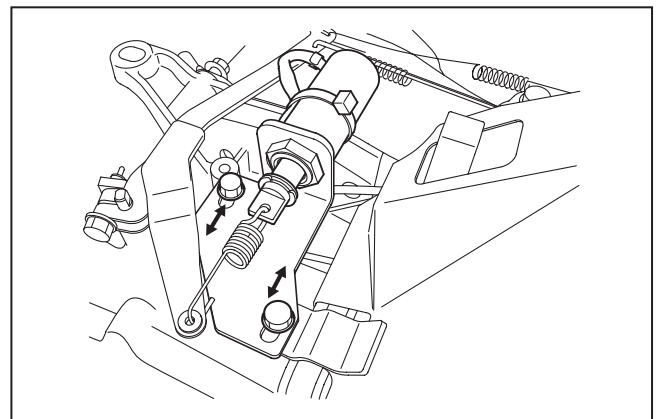
(1) ENGINE SPEED IS NOT INCREASED WHEN A LOAD IS APPLIED

1) Check the wattage of load applied to the generator. If the generator is loaded over the rated wattage, the engine speed can not be increased. Most induction loads such as electric motor or electric tools or welding machine require three to five times large wattage of their ratings at starting. This starting wattage must not exceed the rated output of the generator.

2) Check the slow set r.p.m.
The normal idling speed by the IDLE CONTROL is as follows :

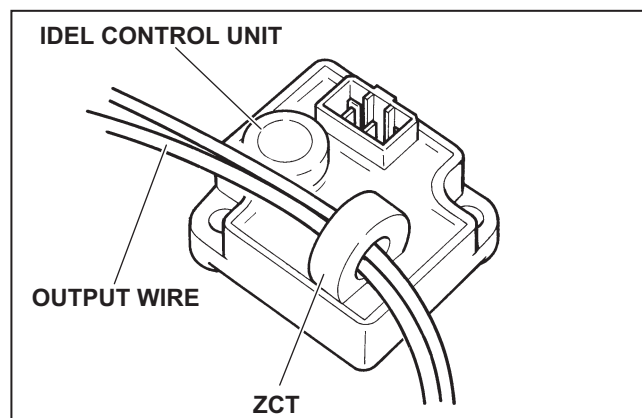
RGX7100/7800 (USA model) . . . 2100 to 2500 r.p.m.

The above speed setting is for cold engine condition. If the engine speed is out of adjusting range, move the solenoid backward.

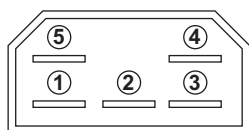


3) Check the wiring through ZCT on the IDLE CONTROL UNIT.

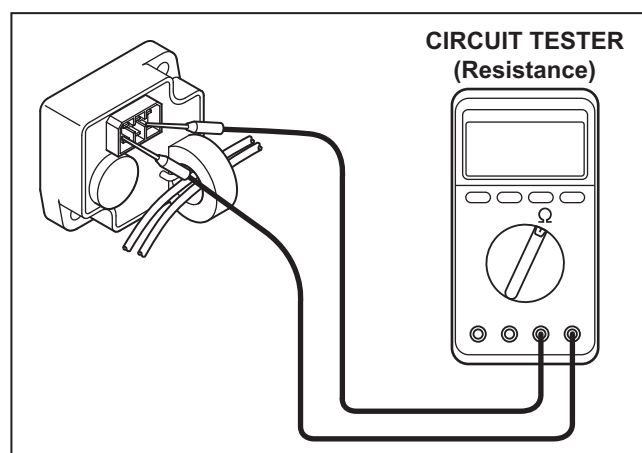
Make sure that an output wire from main coil is passing through the ZCT on the IDLE CONTROL UNIT.



4) Checking the IDLE CONTROL UNIT Check the resistance between five leads of IDLE CONTROL UNIT with circuit tester.



Terminal number of the IDEL CONTROL UNIT



Circuit tester (with battery power source 1.5 V)		Apply black \ominus needle of the circuit tester				
		①	②	③	④	⑤
Apply red \oplus needle of the circuit tester	①	—	∞	250k Ω	250k Ω	75k Ω
	②	∞	—	∞	∞	∞
	③	250k Ω	∞	—	250k Ω	75k Ω
	④	250k Ω	∞	250k Ω	—	75k Ω
	⑤	8.5k Ω	∞	7.8k Ω	7.8k Ω	—

NOTE : The resistance readings vary depending on the types of circuit testers. The above table shows an example of the resistance readings measured by an ordinary analogue circuit tester with 1.5 volt battery power source. It is advisable for you to check the resistance readings using your standard circuit tester and revise the checking table.

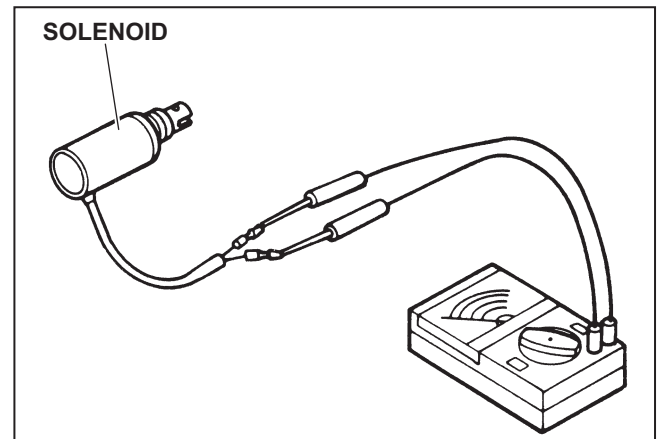
(2) ENGINE SPEED IS NOT REDUCED WHEN LOAD IS OFF

- 1) Check the wiring of SOLENOID.
Check two leads from SOLENOID are
securely connected.
- 2) Check the wiring of IDLE CONTROL UNIT.
Check all leads from IDLE CONTROL UNIT
are securely and correctly connected.

- 3) Checking the SOLENOID.
Measure the resistance between two leads
from SOLENOID.

Normal Resistance (Ω)	25 - 31
--------------------------------	---------

If the resistance is larger or smaller than this
range, SOLENOID is defective,
Replace with a new one.



7. DISASSEMBLY AND ASSEMBLY

7-1 PREPARATION and PRECAUTIONS

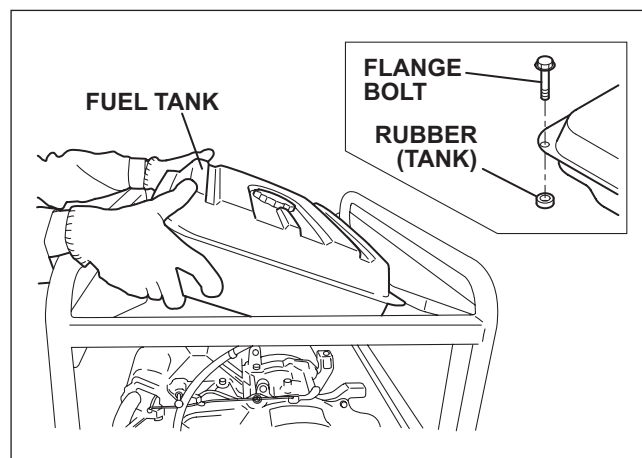
- (1) Be sure to memorize the location of individual parts when disassembling the generator so that the generator can be reassembled correctly. Tag the disassembled part with the necessary information to facilitate easier and smoother reassembly.
- (2) For more convenience, divide the parts into several groups and store them in boxes.
- (3) To prevent bolts and nuts from being misplaced or installed incorrectly, replace them temporarily to their original position.
- (4) Handle disassembled parts with care; clean them before reassembly using a neutral cleaning fluid.
- (5) Remove the battery before disassembling the generator. (Electric start models)
- (6) Use all disassembly/assembly tools properly, and use the proper tool for each specific job.
- (7) Be sure to attach the foam rubber linings inside the covers on their original position when reassembling the generator. When deformation or damage or falling-off of foam rubber lining is found, replace it with new part. Failure to do so will result in poor performance and durability of the generator.
- (8) Bind the wires and fuel pipes using wire bands as they have been done in original configuration.

NOTE : As to detailed information for servicing procedures on engine portion, please refer to Robin engine service manual for "EX35/40".

7-2 DISASSEMBLY PROCEDURES

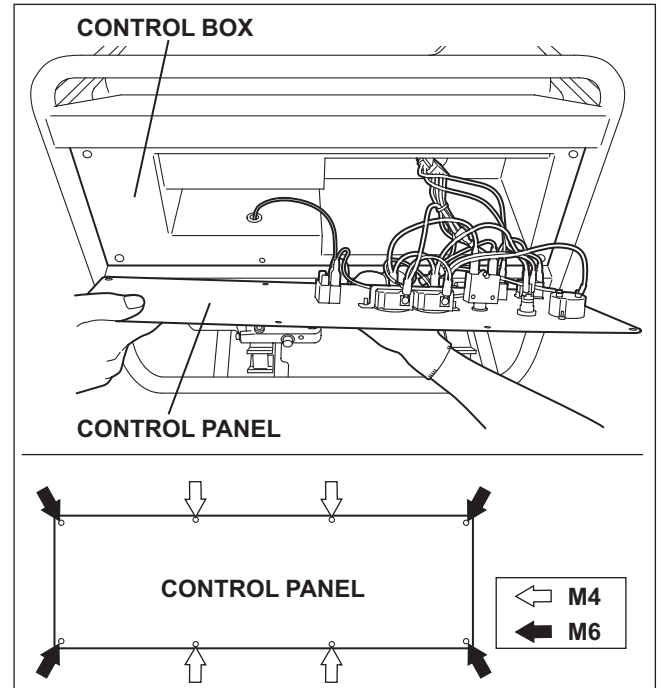
7-2-1 FUEL TANK

- (1) Shut the fuel strainer and discharge fuel from carburetor.
- (2) Disconnect rubber pipe from the strainer.
- (3) Remove the fuel tank.
M6 flange bolt . . . 4 pcs.
Rubber(tank) . . . 4 pcs.



7-2-2 CONTROL PANEL and CONTROL BOX

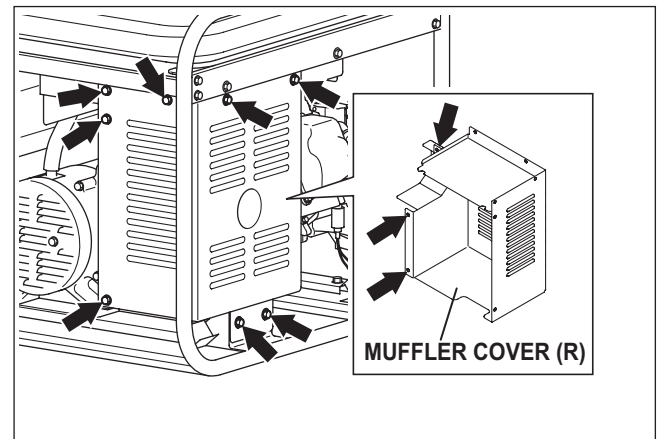
- (1) Remove the control panel.
M6 flange bolt . . . 4 pcs.
M4 flange bolt . . . 4 pcs.
- (2) Disconnect the connectors on the wiring from the control panel to the alternator.
- (3) Remove the control box.



7-2-3 MUFFLER

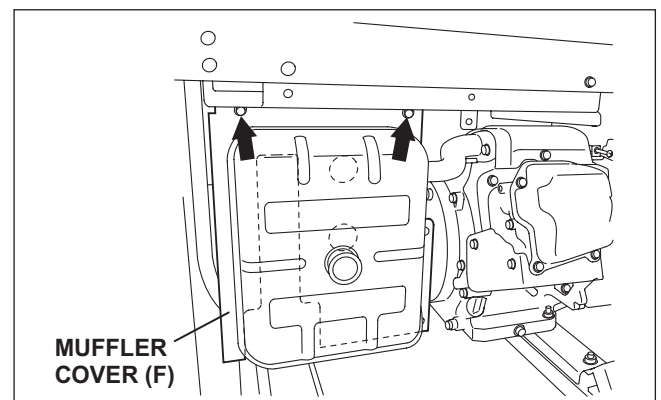
- (1) Remove the Muffler Cover (R).

M6 flange bolt . . . 11 pcs.



- (2) Loosen the bolt for Muffler Cover (F).
M6 flange bolt . . . 2 pcs.

NOTE : Do not remove the flange bolt at this process.

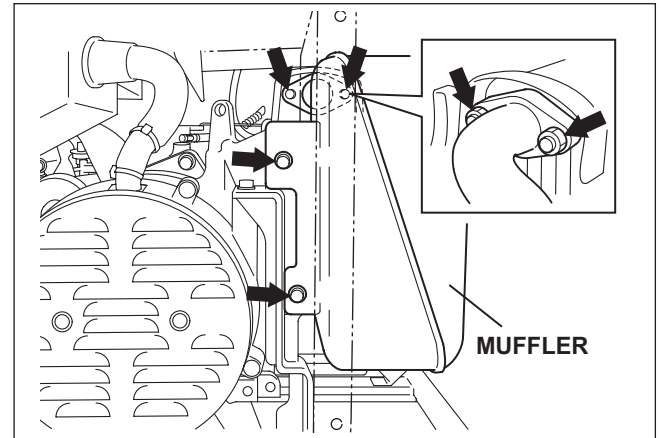


- (3) Remove the Muffler Bracket 2 from Muffler Bracket 1.

M8 flange bolt . . . 2 pcs.

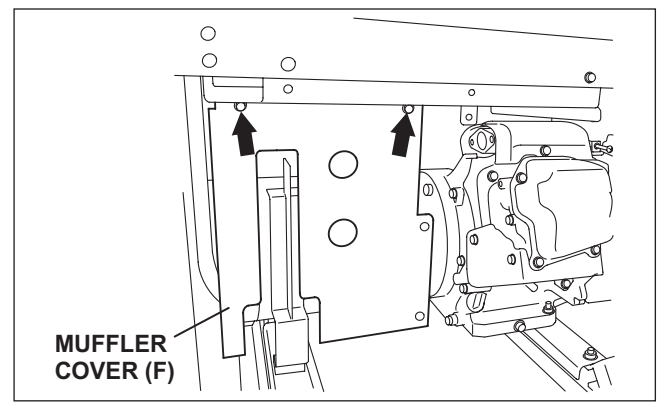
- (4) Loosen Nut and Washer for Exhaust Pipe.
Remove the Muffler from Cylinder Head.

M8 nut and washer . . . 2 pcs. (Exhaust Pipe)



- (5) Remove the Muffler Cover (F).

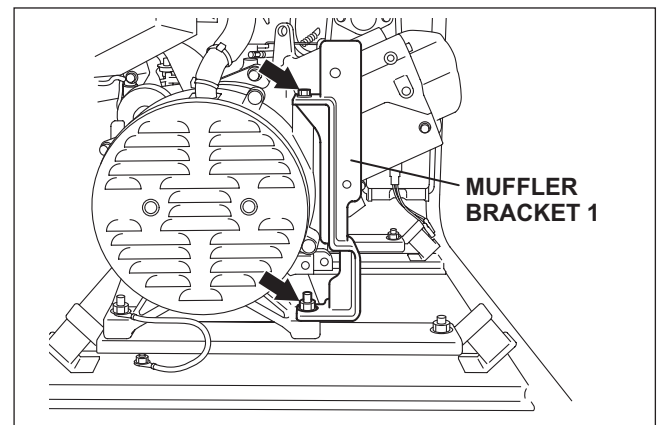
M6 flange bolt . . . 2 pcs.



- (6) Remove the Muffler Bracket 1 from Rear Cover.

M8 flange bolt . . . 1 pc. (Bracket)

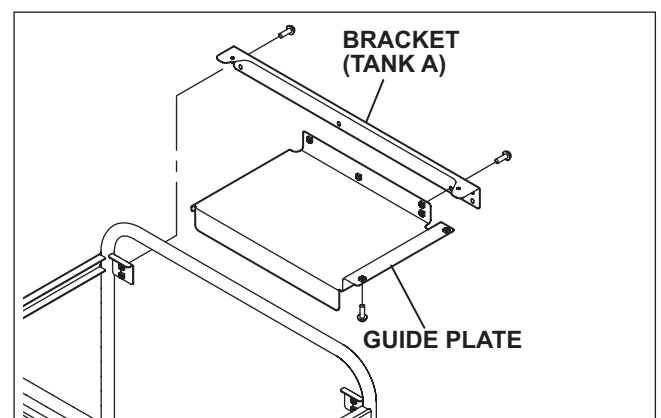
M10 flange nut . . . 1 pc. (with Rear Cover)



- (7) Remove the Guide plate and the Bracket (Tank A) from frame.

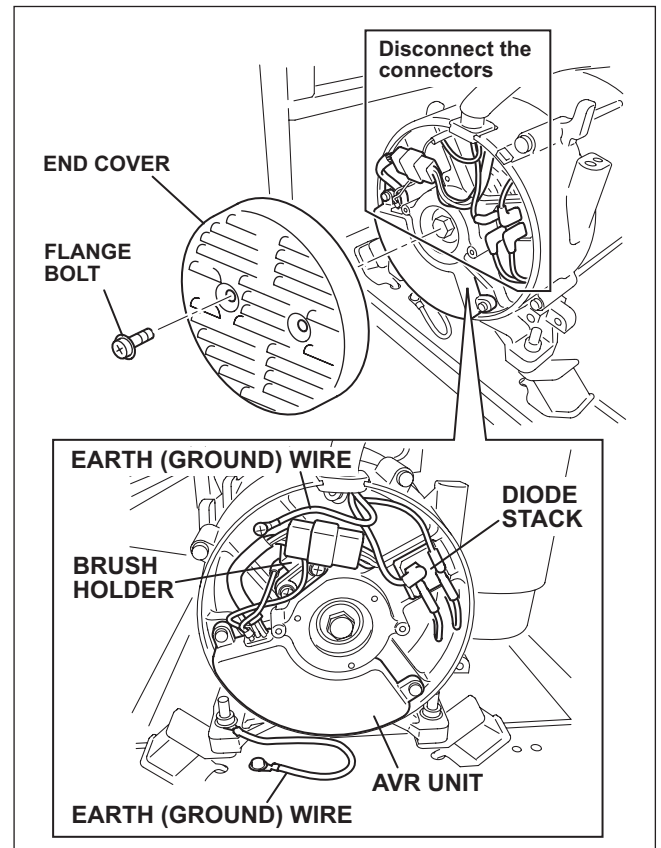
M6 flange bolt . . . 4 pcs. (Guide plate)

M6 flange bolt . . . 4 pcs. (Bracket / Tank A)



7-2-4 ALTERNATOR

- (1) Remove the end cover.
M6 flange bolt . . . 2 pcs.
- (2) Disconnect the connectors on the wiring from the alternator.
- (3) Remove the AVR unit, brush holder and diode stack.



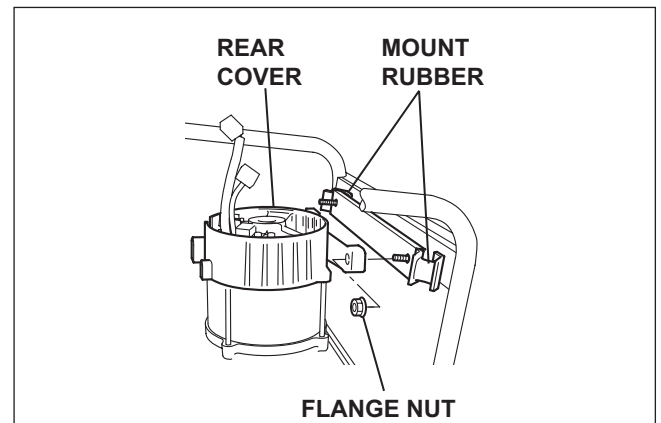
- (4) Set the generator set with the rear cover upwards.

NOTE : Before starting this work, make sure engine oil has been discharged.

- (5) Remove the flange nut fixing rear cover onto the mount base with mount rubber.

M10 flange nut . . . 1 pc.

*Opposite side flange nut has been removed at muffler disassembly process.



(6) Remove the rear cover.

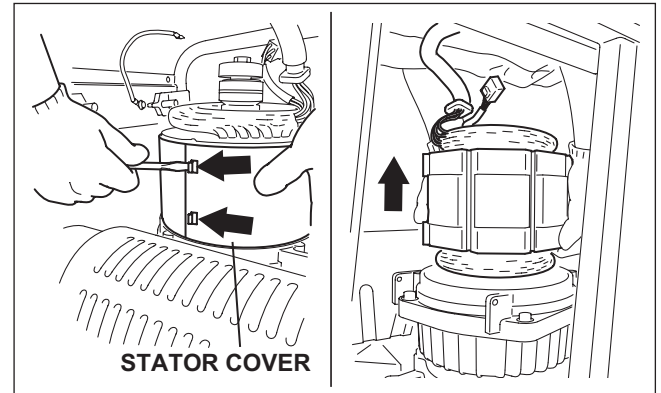
RGX7100 M6 × 180mm . . . 4 pcs.

RGX7800 M6 × 195mm . . . 4 pcs.

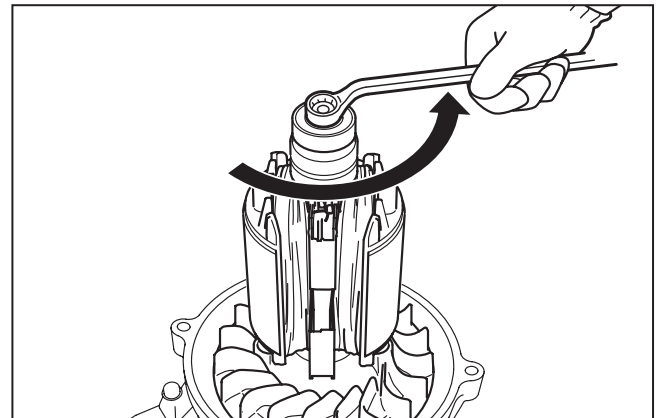
(7) Take out stator cover with crows (2 pcs)
raised up by using screw driver.

(8) Remove the stator.

*NOTE : The stator is heavy. Be careful do not
hit the coil of the stator to the rotor.*

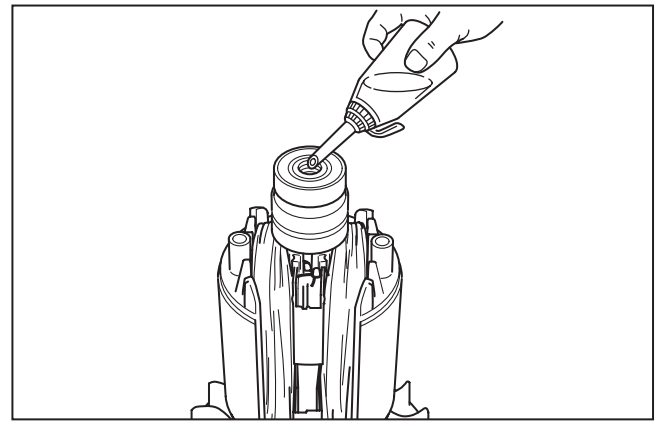


(9) Take off the through bolt of the rotor.

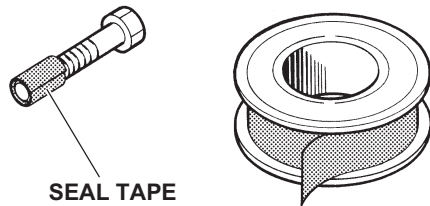


(10) Use a bolt and oil as a tool for pulling out
rotor in the following procedures :

1. Pour engine oil into the center hole of
rotor shaft. Fill with oil to the shaft end.
2. Prepare a bolt with the following thread
size : M12 × 1.75 (RGX7100 / RGX7800)



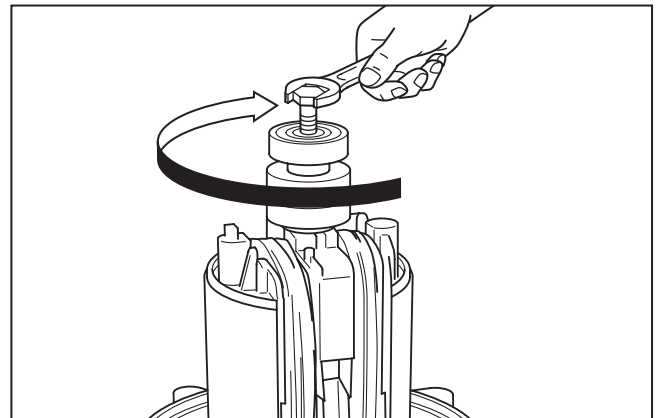
3. Apply a few turns of seal tape around the tip of the bolt.



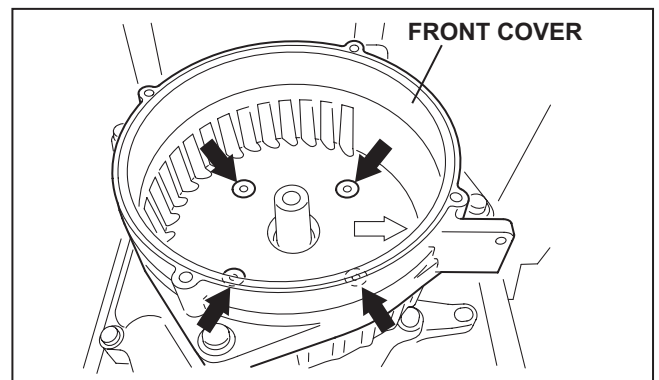
4. Screw the bolt into the thread of the rotor shaft.

5. Torque the bolt using a socket wrench until the rotor comes off loose.

* The hydraulic pressure inside the rotor shaft takes apart the rotor from the engine shaft.

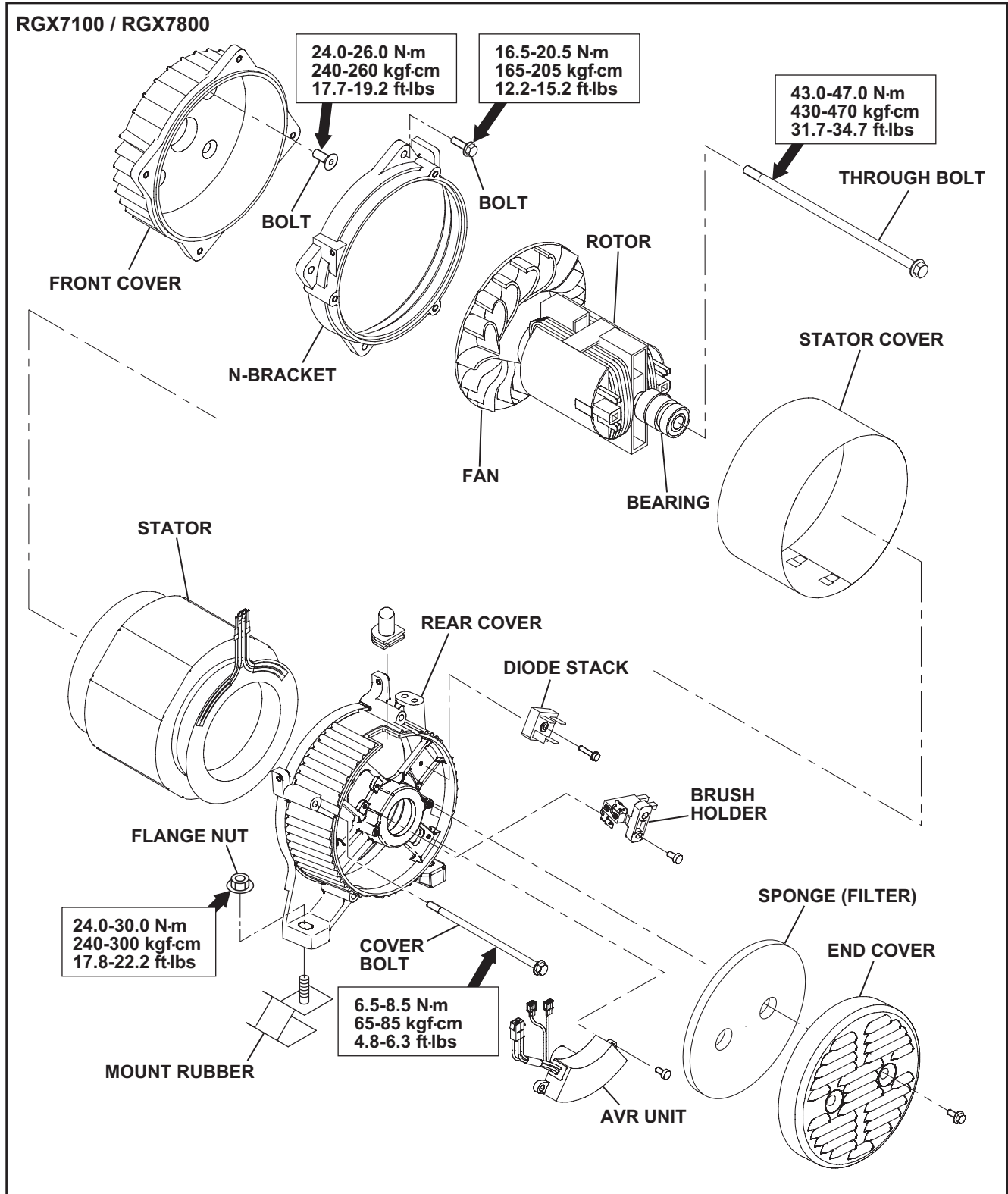


- (11) Remove the front cover.
M8 × 20 bolt(countersunk head) . . . 4 pcs.

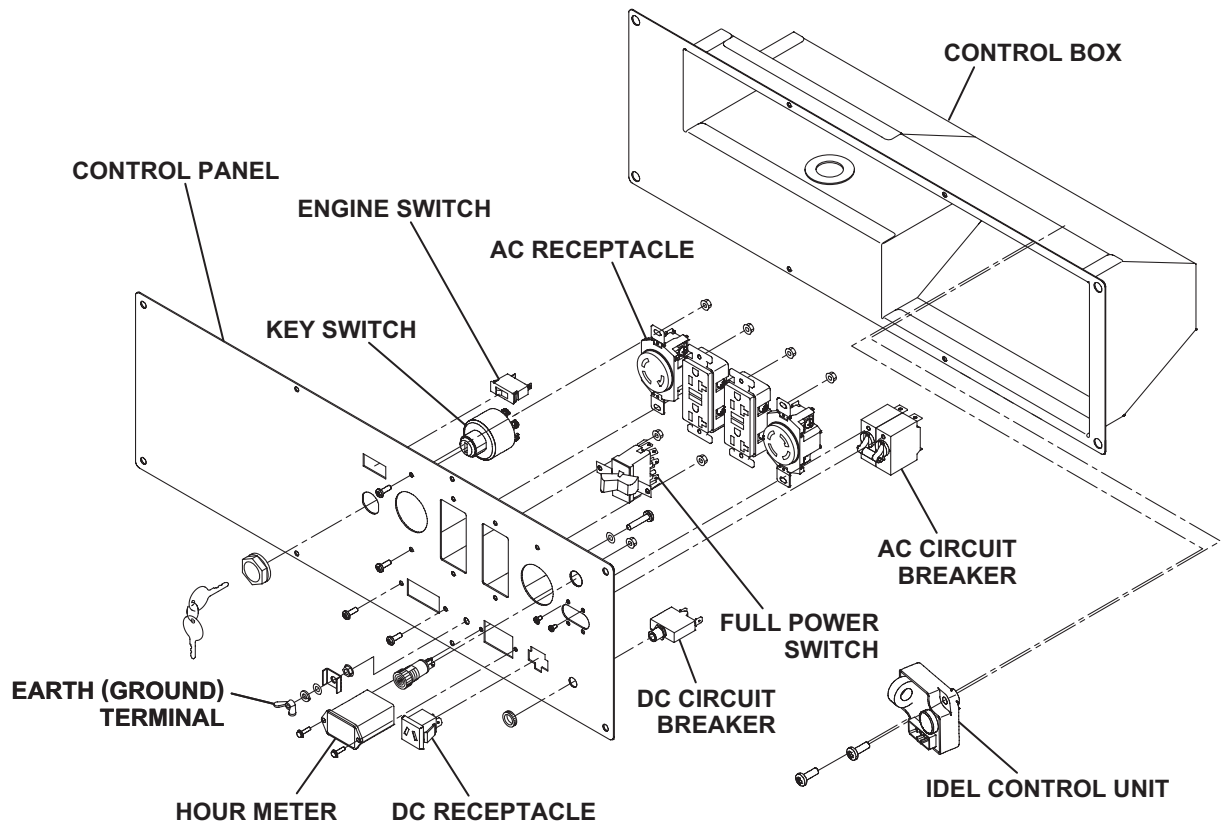


7-3 COMPONENT PARTS

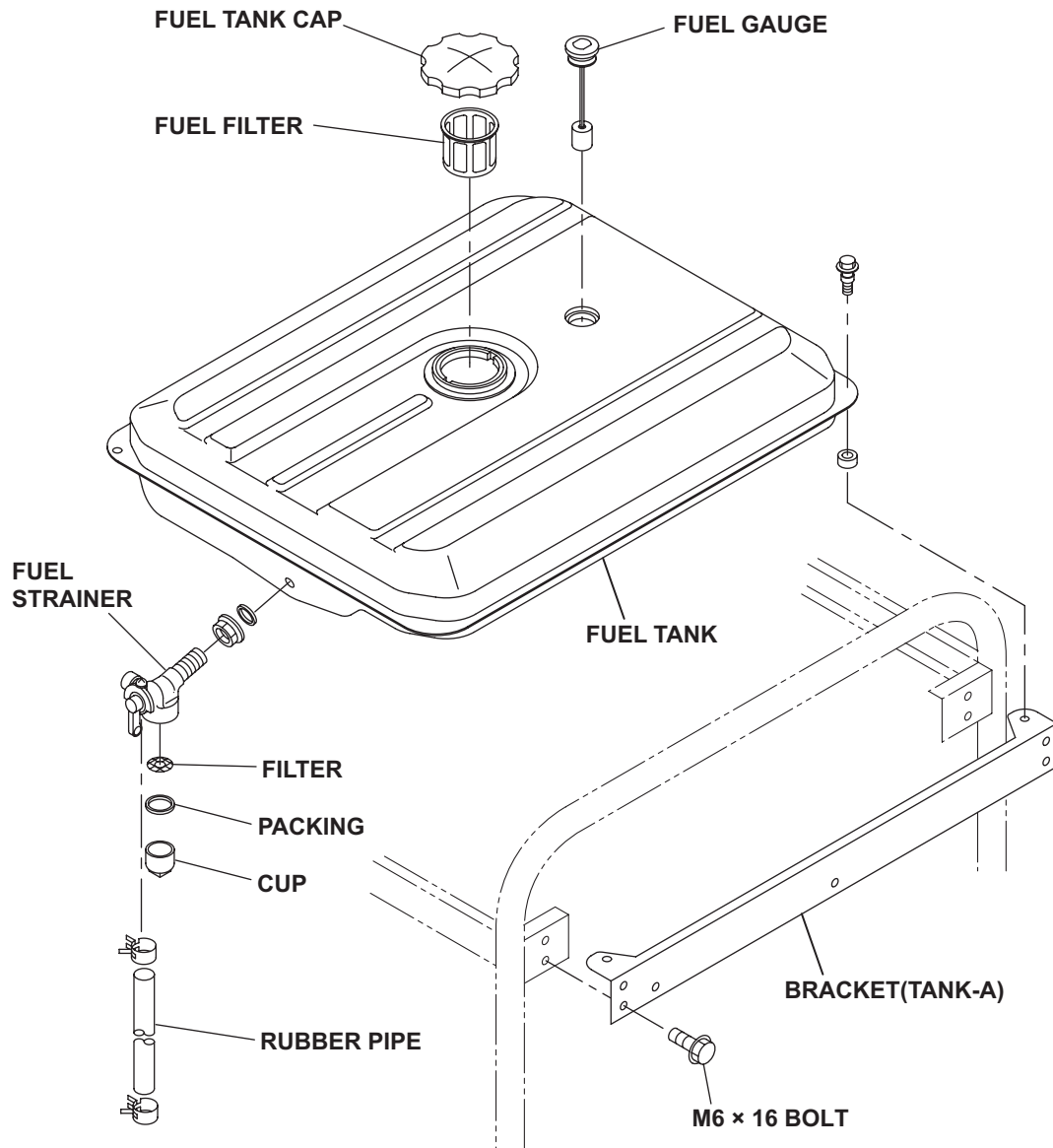
(1) Generator assembly



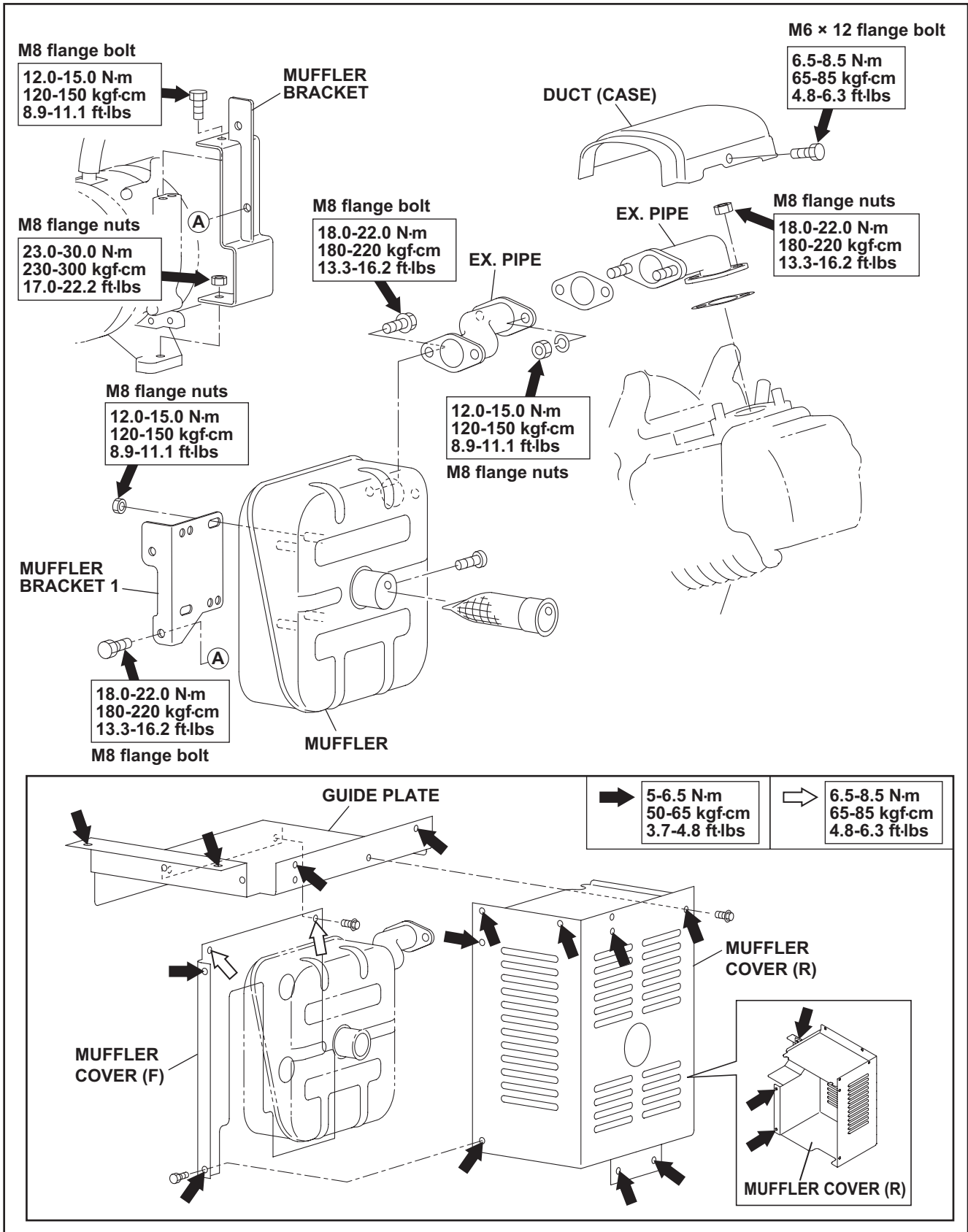
(2) Control Box Assy



(3) Fuel Tank



(4) Muffler



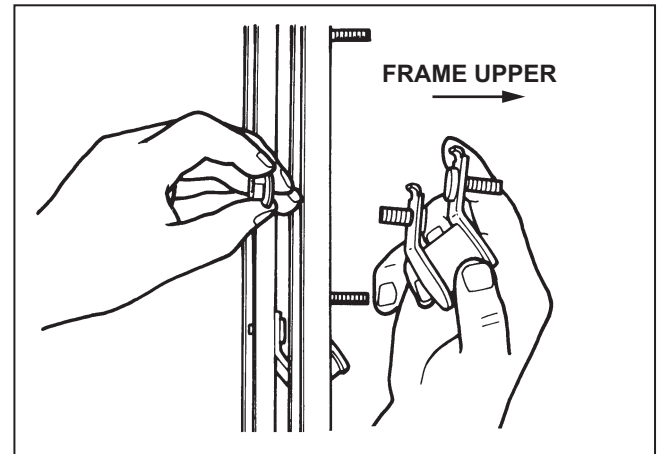
7-4 ASSEMBLY PROCEDURES

7-4-1 ENGINE and FRAME

- (1) Attach the mount rubbers to the frame.
Insert the setting tongue of mount rubber into the hole on the frame and tighten the nut from the bottom of the frame.

M8 flange nut . . . 4 pcs.

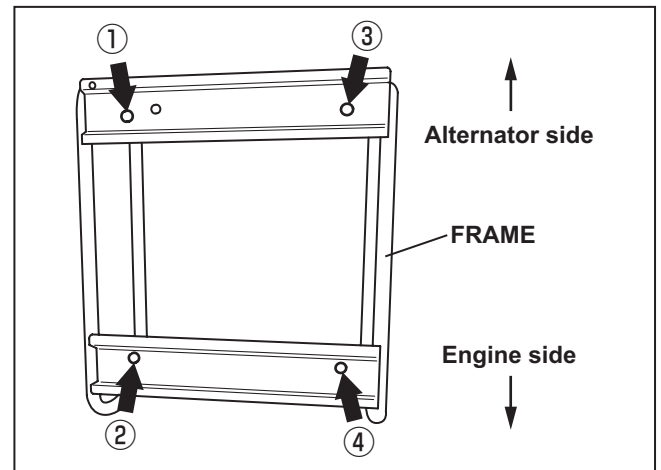
**Tightening torque : 20.0-24.0 N•m
200-240 kgf•cm
(14.8-17.8 ft•lbs)**



*NOTE : There are two type of mount rubber.
Before attaching the mount rubbers,
make sure the position.*

Mount rubber (M10 × 40 bolt) : place ①,②

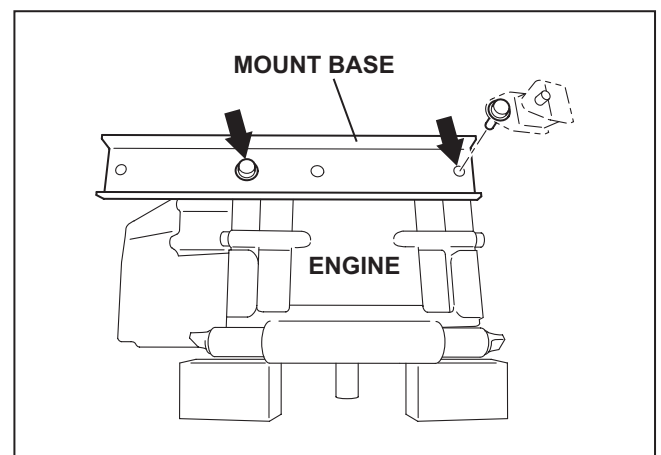
Mount rubber (M10 × 20 bolt) : place ③,④



- (2) Temporally attach the Mount Base to the engine by inserting flange bolt into middle hole on mount base and engine base.
Temporally fix the bolt by nut.

NOTE : Meet other side hole on the mount base with hole of engine base. (Refer to right side picture)

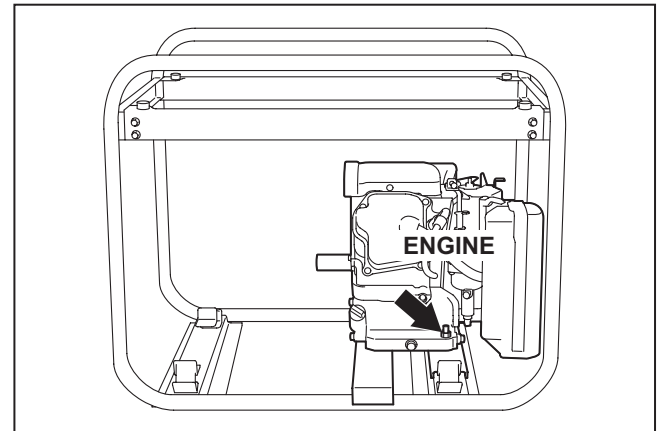
M10 flange nut &
M10 × 40 flange bolt . . . 1 pc.



- (3) Install the engine into the frame from the side of it. Insert the bolt of mount rubbers into the hole on the mount base. Tighten the nuts over the mount rubber bolts to fix.

M10 flange nut . . . 2 pcs.

**Tightening torque : 24.0-30.0 N•m
240-300 kgf•cm
(17.8-22.2 ft•lbs)**



Tighten the temporally fixed bolt and nut for mount base.

M10 flange nut & M10 × 40 flange bolt . . . 1 pc.

**Tightening torque : 24.0-30.0 N•m
240-300 kgf•cm
(17.8-22.2 ft•lbs)**

NOTE : When tightening the nuts, slightly lift the engine so that the weight is not applied to the mount rubbers.

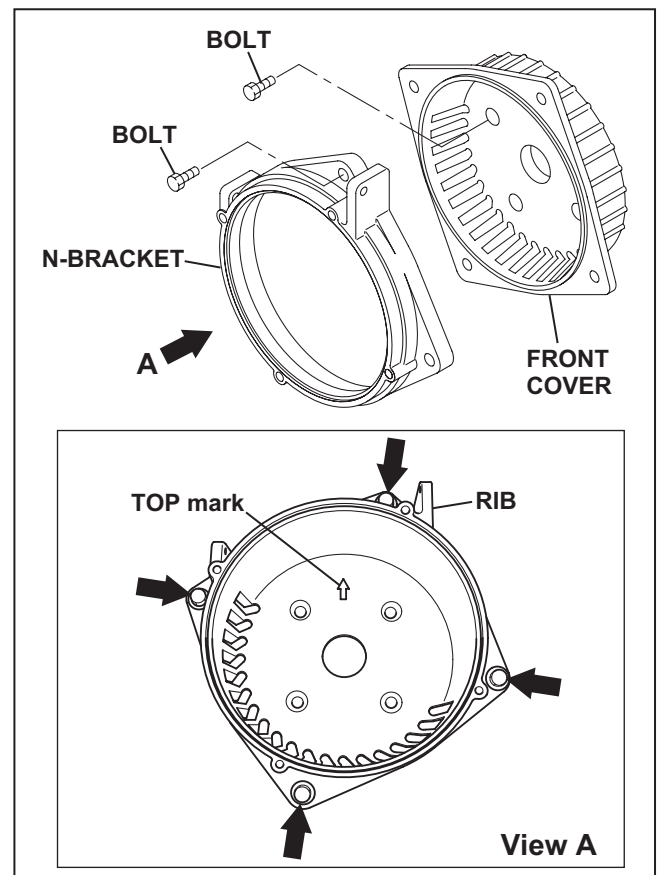
7-4-2 FRONT COVER

- (1) Attach the N-bracket onto the front cover.

NOTE : Match the rib direction on the N-bracket with the top mark on the front cover surface.

M8 × 20 flange bolt . . . 4 pcs.

**Tightening torque : 16.5-20.5 N•m
165-205 kgf•cm
(12.2-15.2 ft•lbs)**

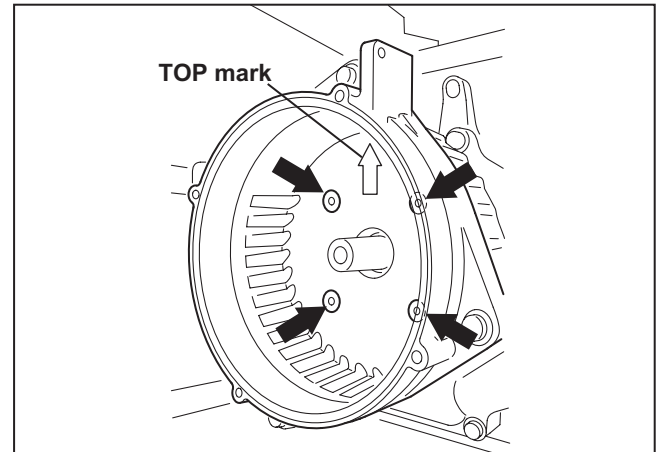


- (2) Attach the front cover to the engine main bearing cover.

NOTE : Match the top mark on the front cover surface with upside direction.

M8 × 20 bolt(countersunk head) . . . 4 pcs.

**Tightening torque : 24.0-26.0 N•m
240-260 kgf•cm
(17.8-19.2 ft•lbs)**



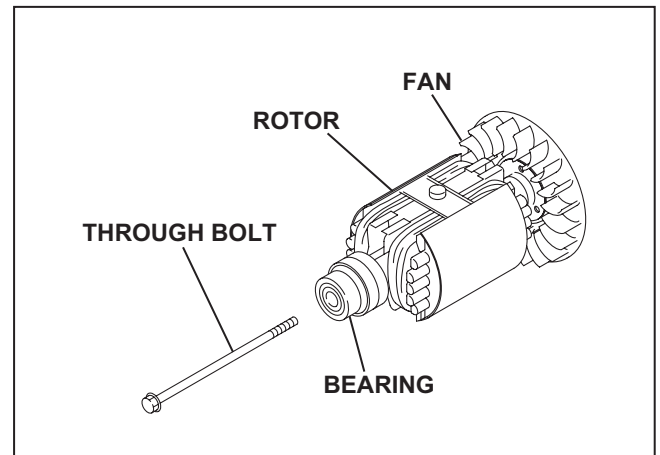
7-4-3 ROTOR

- (1) Wipe off oil, grease and dust from the tapered portion of engine shaft and matching tapered hole of rotor shaft.
- (2) Mount the rotor to the engine shaft.
Tighten the through bolt.

M10 × 285 flange bolt . . . 1 pc.(RGX7100)

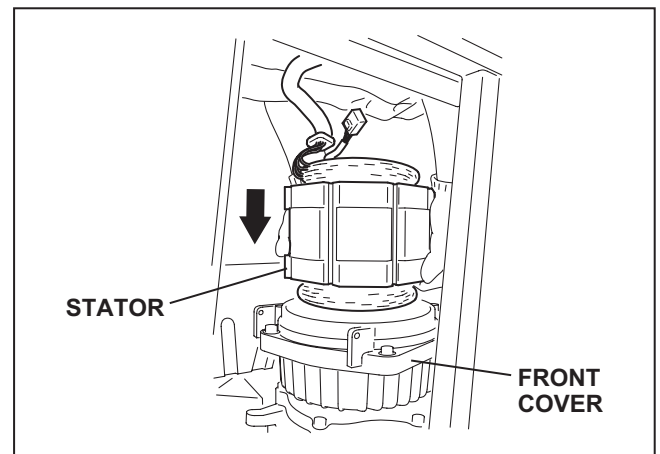
M10 × 300 flange bolt . . . 1 pc.(RGX7800)

**Tightening torque : 43.0-47.0 N•m
430-470 kgf•cm
(31.8-34.8 ft•lbs)**



7-4-4 STATOR

- (1) Put the stator in the front cover.



7-4-5 REAR COVER

- (1) Put the rear cover over the rotor.
Pull out the stator wirings through the opening of the rear cover.

NOTE : Be careful not to give cuts to wires when pulling them out from the rear cover.

- (2) Tap on the rear cover evenly with a plastic hammer to press the rotor bearing into the rear cover.

- (3) Fix the rear cover with bolts.

NOTE : Tighten the bolts evenly and in turns.

M6 × 180 flange bolt . . . 4 pcs.

Tightening torque :	6.5-8.5	N•m
	65-85	kgf•cm
	(4.8-6.3	ft•lbs)

- (4) Temporally attached the Muffler Bracket 1 to the Rear Cover.

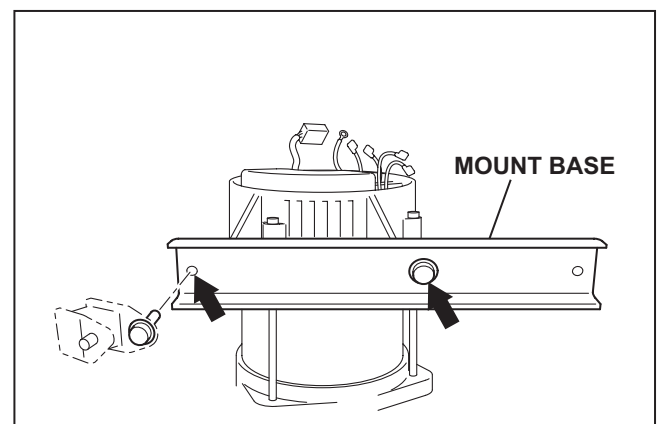
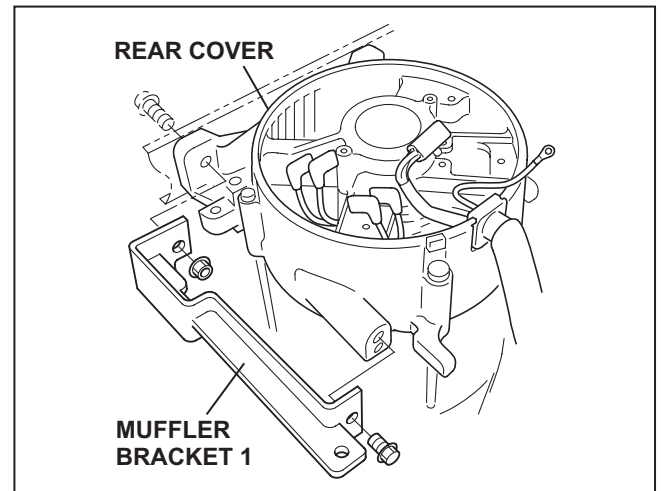
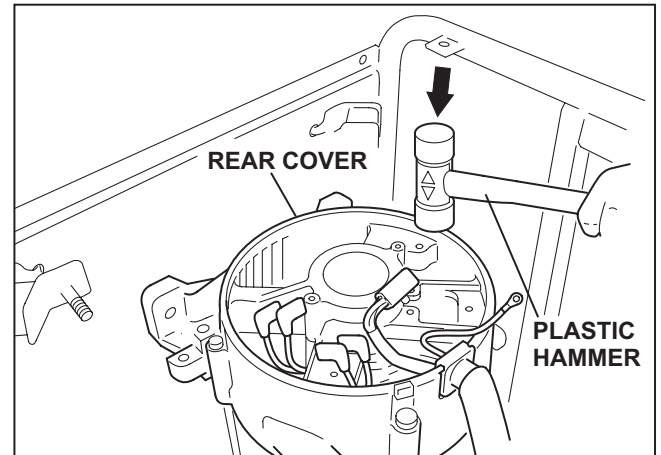
M8 × 16 flange bolt . . . 1 pc.

- (5) Temporally assemble the Mount Base to the Rear Cover by inserting flange bolt into middle hole on Mount Base, Rear Cover hole and Muffler Bracket 1 hole.
Temporally fix the bolt by nut.

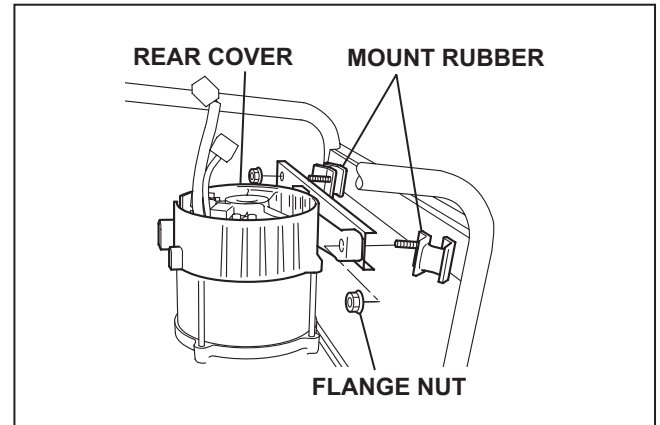
*NOTE : Meet other side hole on the Mount Base with hole of Rear Cover.
(Refer to right side picture)*

M10 flange nut &

M10 × 40 flange bolt . . . 1 pc.



- (6) Set the Mount Rubber bolts into the Mount Base holes.
Don't tighten the nut at this moment.



- (7) Install the brush holder, AVR unit and diode stack in the rear cover.

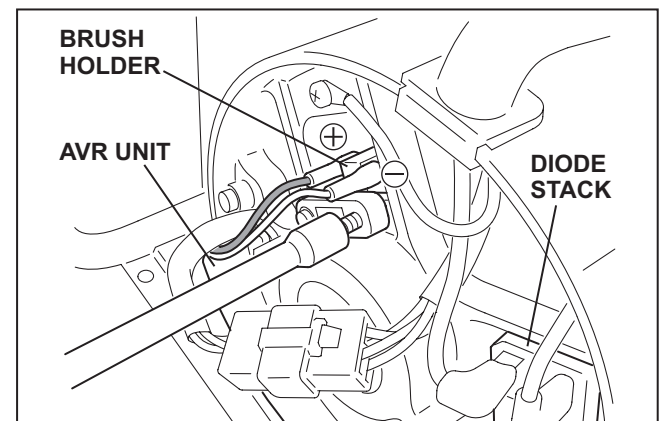
M5 × 16 bolt . . . 2 pcs. (AVR unit)

Tightening torque :	4.0-4.5	N•m
	40-45	kgf•cm
	(3.0-3.3)	ft•lbs)

M5 × 16 bolt . . . 2 pcs. (brush holder)

M4 × 18 bolt . . . 1 pc. (diode stack)

Tightening torque :	1.5-2.0	N•m
	15-20	kgf•cm
	(1.1-1.5)	ft•lbs)



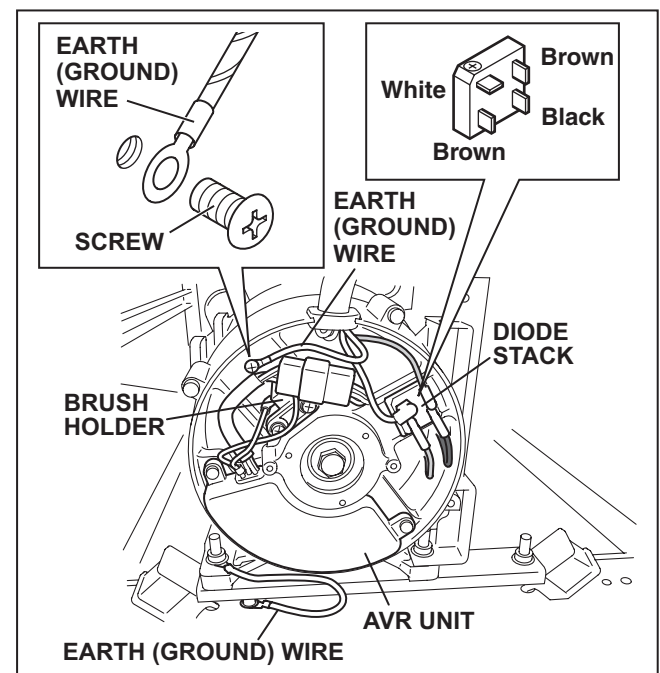
	Wiring color	
	Plus ⊕	Minus ⊖
A.V.R. type (A)	Blue	Yellow
A.V.R. type (B)	Red	White

NOTE : If the brush is installed oblique to the slip ring, there is possibility that the brush holder can break when the screw is tightened : or the brush may break when generator of started. Make this process carefully.

- (8) Attach the connectors to the brush holder, AVR unit and diode stack.

- (9) Connect the earth (ground) wire (green/ yellow) with the rear cover with screw.

- (10) Connect earth (ground) wire between frame and rear cover.
On frame side: M6 × 12 bolt . . . 1 pc.
On rear cover side: 8mm nut
(commonly tighten the mount rubber bolt)



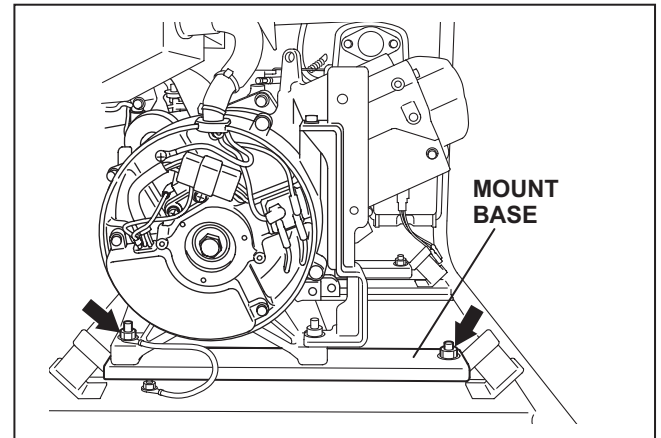
(11) Tighten the nuts over the mount rubber bolts to fix.

NOTE : When tightening the nuts, slightly lift the alternator assembly so that the weight is not applied to the mount rubbers.

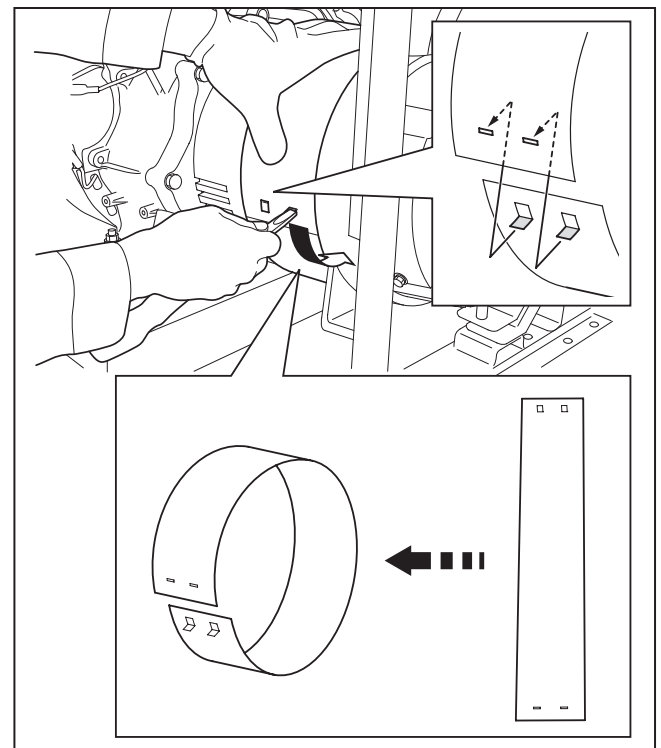
M10 flange nut . . . 2 pcs.

**Tightening torque : 24.0-30.0 N•m
240-300 kgf•cm
(17.8-22.2 ft•lbs)**

*NOTE : Do not tighten the nut and the bolt for Muffler Bracket 1.
After attaching Muffler to the Engine,
the nut and the bolt are fixed.*

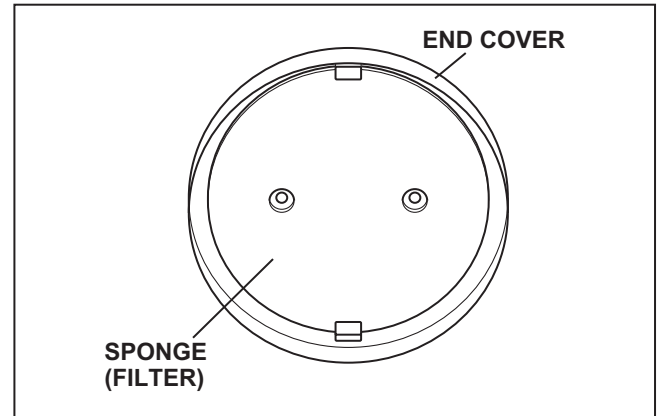


(12) Set stator cover with the claw inserted into slit and bent (2 pcs).



(13) Set the Sponge(Filter) to inside of End Cover.

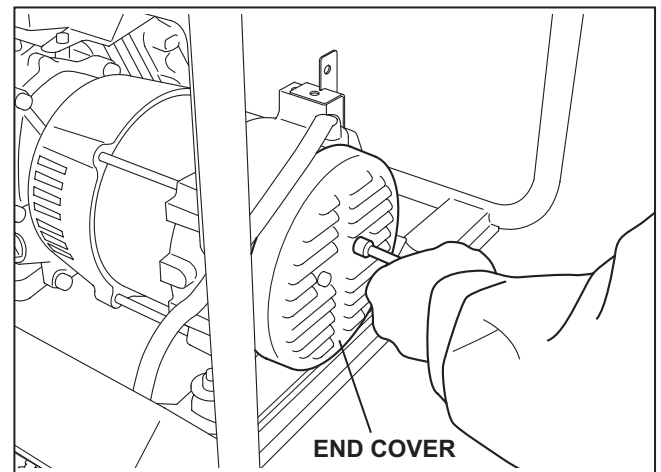
NOTE : Hold the Sponge by tab of End Cover.



(14) Attach the end cover to the rear cover.

M5 × 16 bolt . . . 2 pcs.

Tightening torque :	4.0-4.5	N•m
	40-45	kgf•cm
	(3.0-3.3	ft•lbs)



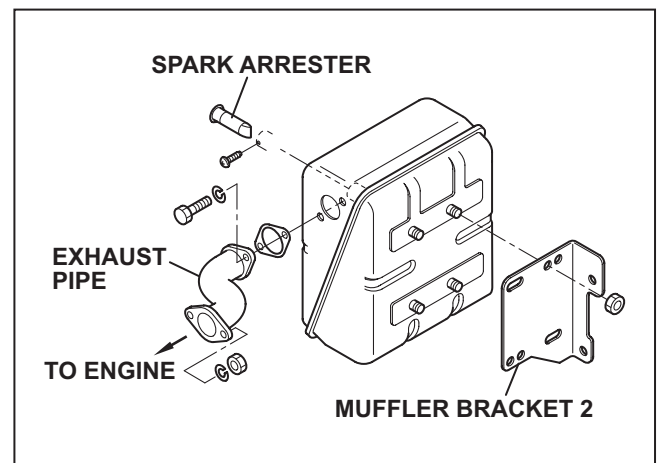
7-4-6 MUFFLER and MUFFLER COVER

(1) Attach the Exhaust Pipe (with gasket), Muffler Bracket 2 and Spark Arrester to the Muffler.
M8 nut and Washer . . . 2pcs.(exhaust pipe
(with gasket))

Tightening torque :	12.0-15.0	N•m
	120-150	kgf•cm
	(8.9-11.1	ft•lbs)

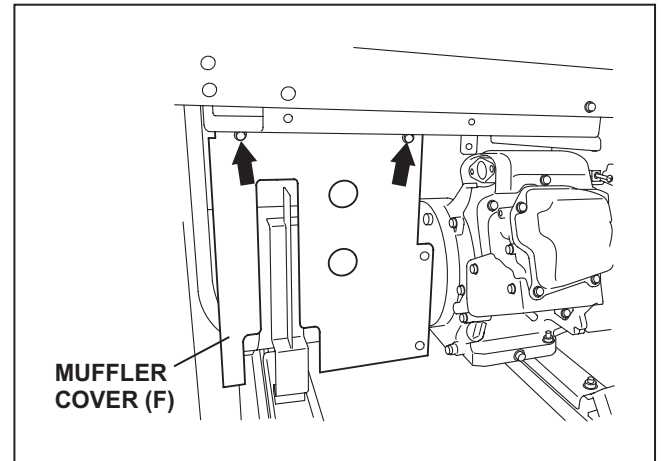
M8 nut . . . 4pcs.(muffler bracket 2)

Tightening torque :	12.0-15.0	N•m
	120-150	kgf•cm
	(8.9-11.1	ft•lbs)



(2) Temporally attach the Muffler Cover (F) to the flame.

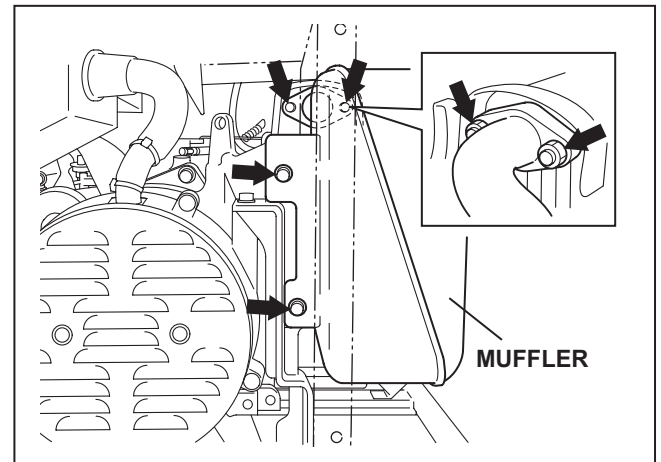
M6 × 10 flange bolt . . . 4 pcs.



(3) Temporally attach the muffler and gasket to the cylinder head. Temporally attach the muffler bracket 2 to Muffler bracket 1. After that, tighten the nuts and flange bolts.

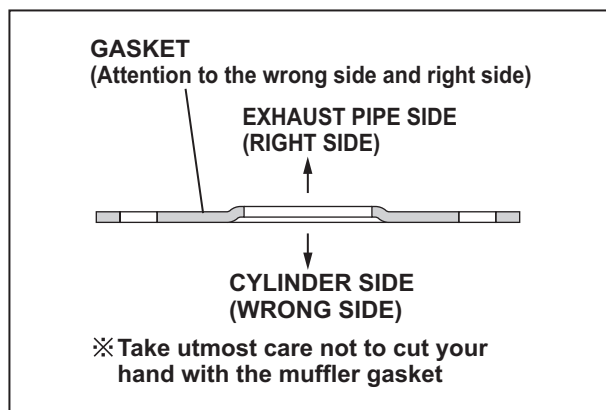
M8 nut . . . 2 pcs. (cylinder head)

Tightening torque : 18.0-22.0 N•m
180-220 kgf•cm
(13.2-16.2 ft•lbs)



M8 × 16 flange bolt . . . 2 pcs.
(Muffler Bracket 1)

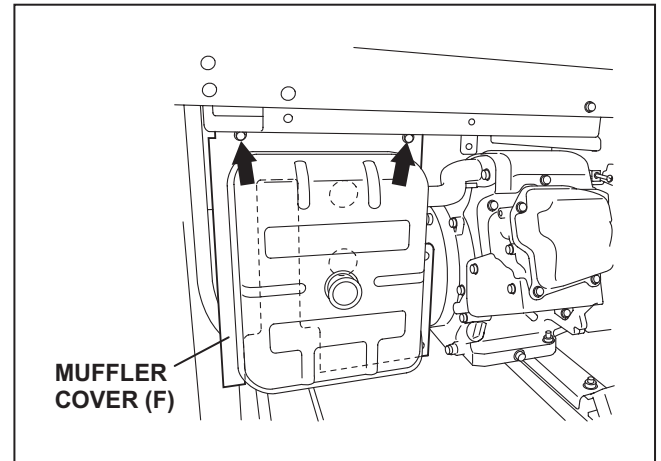
Tightening torque : 12.0-15.0 N•m
120-150 kgf•cm
(8.9-11.1 ft•lbs)



(4) Tightening the Muffler Cover (F).

M6 × 40 flange bolt . . . 2 pcs.

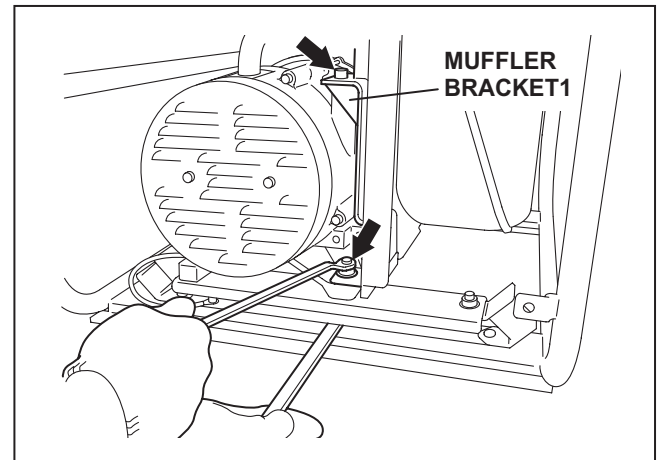
Tightening torque :	6.5-8.5	N•m
	65-85	kgf•cm
	(4.8-6.3	ft•lbs)



(5) Tightening the Muffler Bracket 1.

M10 nut and
M10 × 40 flange bolt . . . 1 pc.
(with rear cover)

Tightening torque :	24.0-30.0	N•m
	240-300	kgf•cm
	(17.8-22.2	ft•lbs)



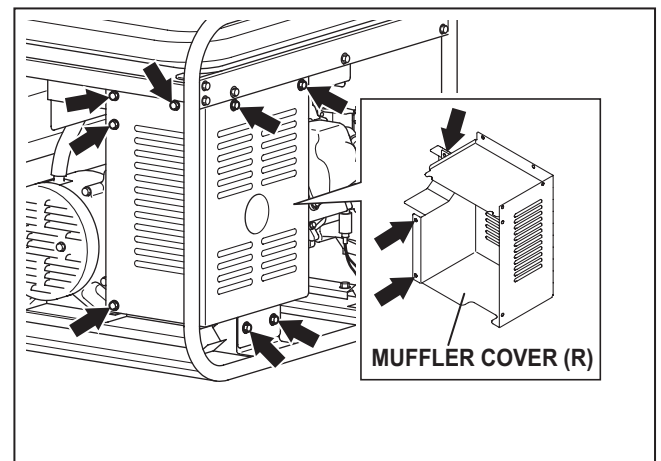
M8 × 16 flange bolt . . . 1 pc.

Tightening torque :	16.5-20.5	N•m
	165-205	kgf•cm
	(12.2-15.2	ft•lbs)

(6) Attach the muffler cover to the frame.

M6 × 10 flange bolt . . . 11 pcs.

Tightening torque :	6.5-8.5	N•m
	65-85	kgf•cm
	(4.8-6.3	ft•lbs)



7-4-7 FUEL TANK

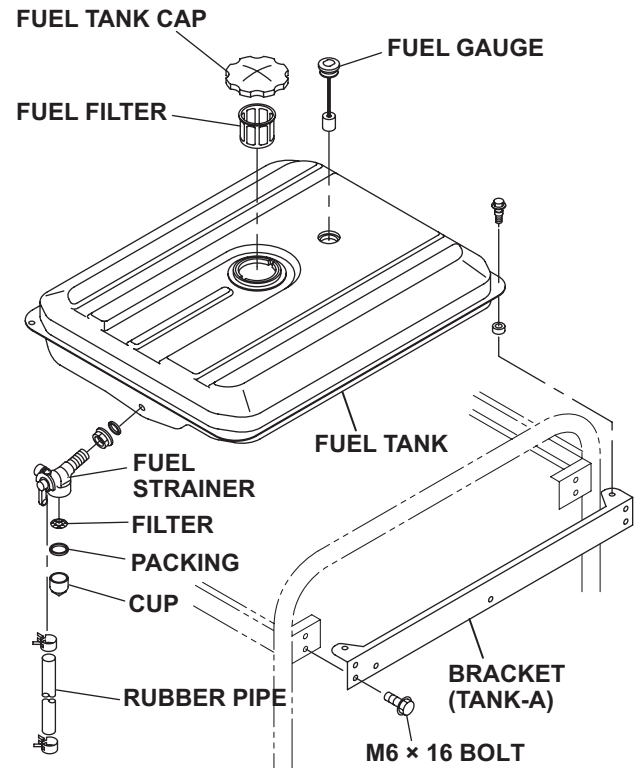
- (1) Hand tighten the strainer screw as far as it will go, loosen it again by one or two rotations (fuel outlet faces down), then tighten the lock nut.
- (2) Mount the fuel tank on the frame with rubber washers between the tank flange and the frame.

M6 x 20 mm bolt (black) . . . 4 pcs.
Rubber washer . . . 4 pcs.

NOTE : For easy tank assembly, glue the rubber washers over the mounting holes of the frame.

- (3) Connect the rubber pipe.
First, fit the hose clamps on the rubber pipe and connect it to the strainer and the carburetor. Then fasten it with the hose clamps.

NOTE : Apply a drop of oil to the rubber pipe for easier connection.



7-4-8 CONTROL BOX ASSY

Refer to Section 7-5 for disassembly, checking and reassembly procedures of the control panel.

- (1) Put the cover onto the frame temporary.

NOTE : Don't set bolt for the control box.

- (2) Pass wires drawn out generator and engine to the control box.

- (3) Connect the wires coming from the control panel with wires coming from generator and engine.

NOTE : Connect the wires of the same color.

- (4) Install the control panel onto the control box.

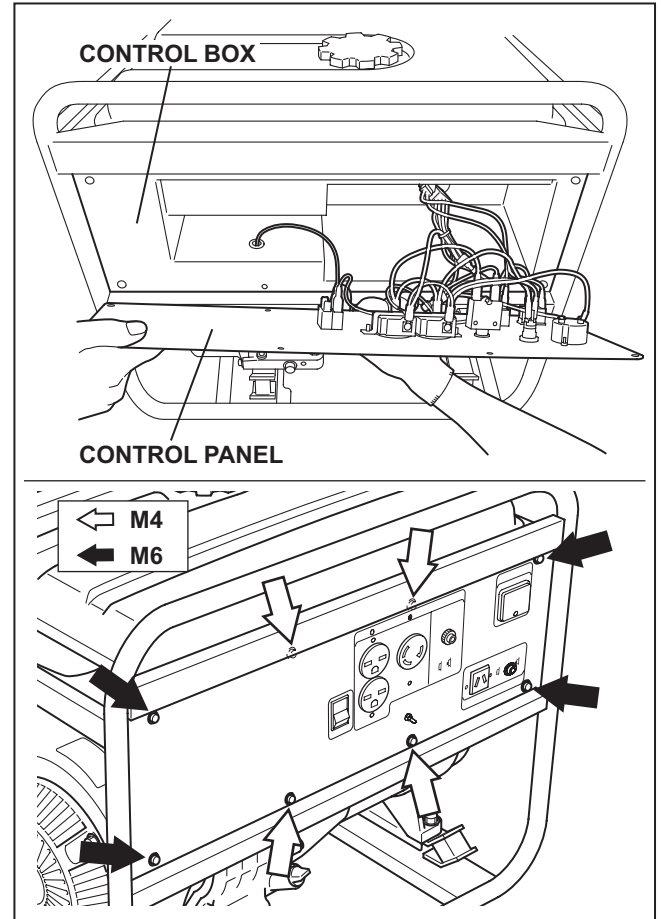
M4 × 12 mm Screw . . . 4 pcs.

Tightening torque :	5.0-6.0	N•m
	50-60	kgf•cm
	(3.7-4.8	ft•lbs)

- (5) Mount the control panel together with the control box (Control box Assembly) onto the frame.

M6 × 12 mm Screw . . . 4 pcs.

Tightening torque :	5.0-6.0	N•m
	50-60	kgf•cm
	(3.7-4.8	ft•lbs)



7-5 CHECKING, DISASSEMBLY and REASSEMBLY of the CONTROL PANEL

7-5-1 CHECKING OF THE CONTROL PANEL

Dismount the control box assy from frame. Remove the control box from control panel and check each components and wiring. Refer to Section 6 for the detail of checking procedure for the components in the front panel.

7-5-2 DISASSEMBLY

- (1) Remove the control panel from the control box.
- (2) Disconnect the connectors on the wires to detach the control panel.
- (3) After disconnecting individual wires, remove the control panel components.

7-5-3 REASSEMBLY

- (1) Install the receptacles, circuit breakers, terminals, switches, etc. on the control panel and wire them.

NOTE : Circuit diagrams are shown in Section 9. Colored wires are used for easy identification, and are of the correct capacity and size. Use heat-resistant type wires (permissible temperature range 75°C or over) in the specified gauge shown in the circuit diagrams.

- (2) Connect the wires of control panel components.
- (3) Attach the control panel and control box to the Frame.
(Refer to 7-4-8 for details.)

8. TROUBLESHOOTING

8-1 NO AC OUTPUT

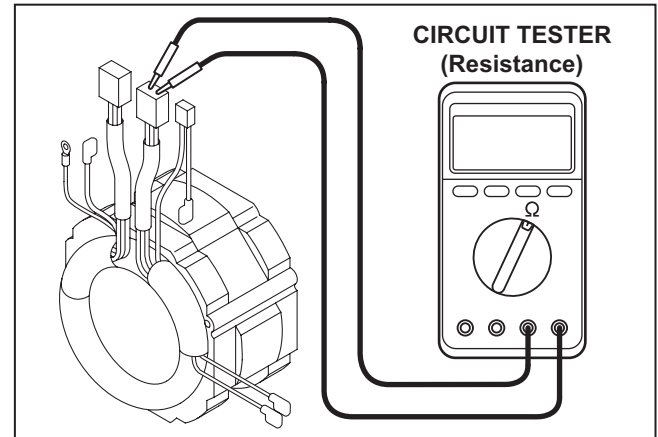
8-1-1 CHECKING STATOR

(1) Remove control panel and disconnect stator wires at the connectors.

(2) Measure the resistance between terminals on stator leads.

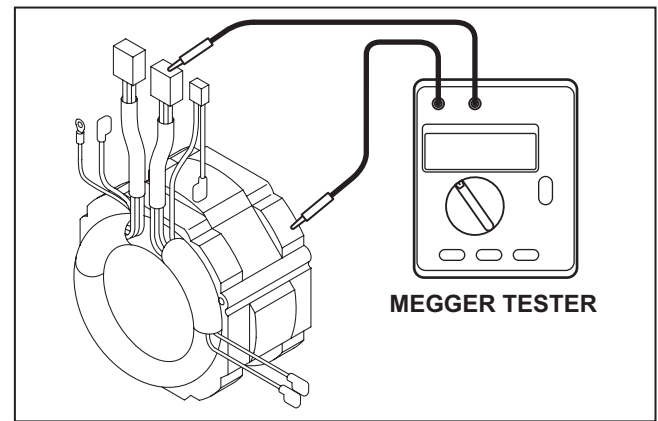
Refer to Table of Section 6-3 STATOR for normal resistance.

If stator is faulty, replace it with a new one.



(3) Check the insulation resistance between stator core and each stator lead using a megger tester.

If insulation is bad, replace stator with a new one.

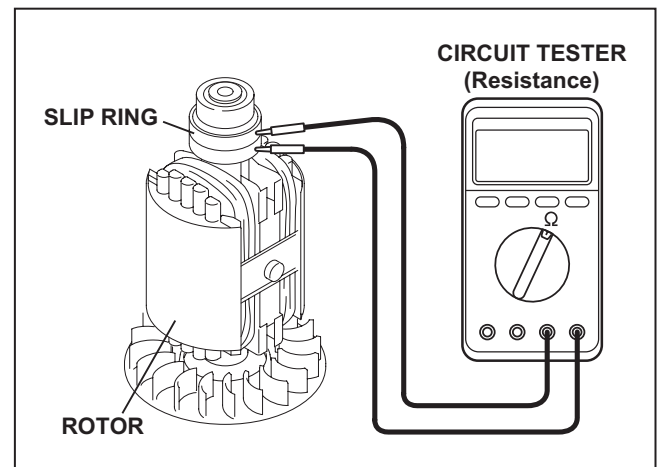


8-1-2 CHECKING ROTOR

1) Field coil

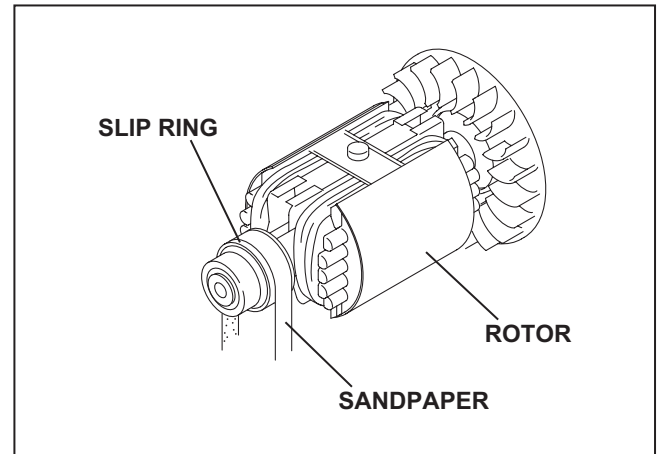
Remove the brush holder and measure resistance between the slip rings. Refer to Section 6-4 ROTOR ASSEMBLY for normal resistance.

NOTE : If the circuit tester is not sufficiently accurate, it may not show the values given and may give erroneous readings. Erroneous reading will also occur when there is a wide variation of resistance among coil windings or when measurement is performed at ambient temperatures different from 20°C (68°F).



2) Cleaning Slip rings

The slip ring surfaces must be uniformly bright. Slip rings showing black spots, excessive wear, or uneven wear must be repaired. A stained slip ring lowers generator efficiency and output voltage. Polish the slip rings with fine sandpaper while turning the rotor until rough spots disappear. Care should be taken not to touch the rotor coils with the sandpaper.



8-2 AC VOLTAGE IS TOO HIGH OR TOO LOW

8-2-1 CHECKING ENGINE SPEED

If the engine speed is too high or too low, adjust it to the rated r.p.m.

[How to adjust engine r.p.m.]

- * Loosen the lock nut on the adjusting screw.
- * Turn the adjusting screw clockwise to decrease engine speed or counterclockwise to increase engine speed.

Normal engine speed at no load :

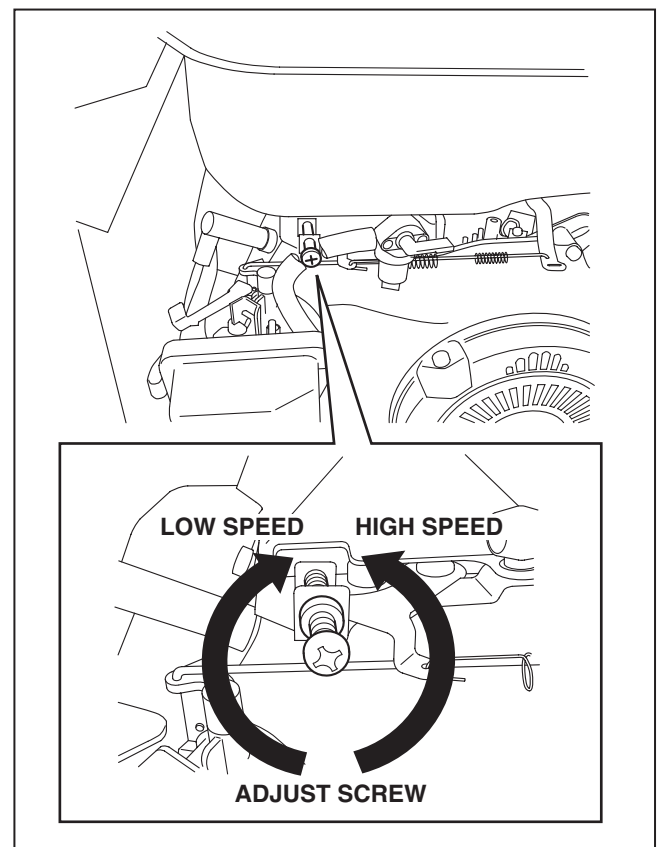
3050 to 3250 rpm for 50Hz type
3650 to 3850 rpm for 60Hz type

8-2-2 CHECKING STATOR

Check stator referring to Step 8-1-1.

8-2-3 CHECKING ROTOR

Check rotor referring to Step 8-1-2.



8-3 AC VOLTAGE IS NORMAL AT NO-LOAD, BUT THE LOAD CANNOT BE APPLIED.

8-3-1 CHECK THE ENGINE SPEED.

If the engine speed is low, adjust it to the rated r.p.m.

*Refer to Step 8-2-1 for engine speed adjustment.

8-3-2 CHECK THE TOTAL WATTAGE OF APPLIANCES CONNECTED TO THE GENERATOR.

Refer to Section 4 "RANGE OF APPLICATIONS" for the wattage of the appliances.

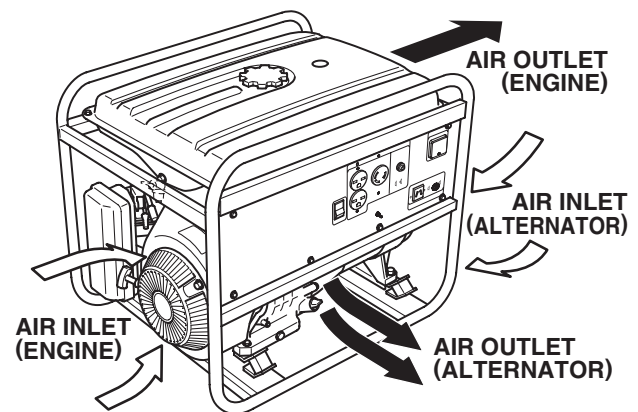
If the generator is overloaded, reduce the load to the rated output of the generator.

8-3-3 CHECK THE APPLIANCE FOR TROUBLE.

If the appliance is faulty, repair it.

8-3-4 CHECK IF THE ENGINE IS OVERHEATED.

If the cooling air inlet and/or cooling air outlet is clogged with dirt, grass, chaff or other debris, remove it.

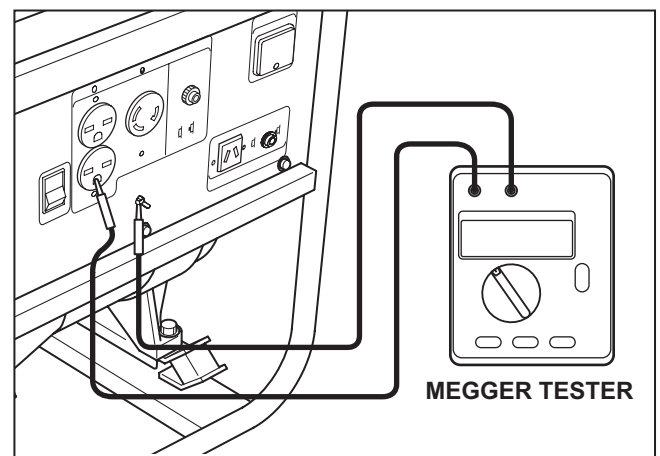


8-3-5 CHECK THE INSULATION OF THE GENERATOR.

- (1) Stop the engine. Remove the control panel, and disconnect the connector of GREEN lead for ground.
- (2) Measure the insulation resistance between the live terminal of the receptacle and the ground terminal.

If the insulation resistance is less than $1M\Omega$, disassemble the generator and check the insulation resistance of the stator, rotor and the live parts in the control box. (Refer to Section 5-4.)

Any part where the insulation resistance is less than $1M\Omega$, the insulation is faulty and may cause electric leakage.
Replace the faulty part.



8-4 NO DC OUTPUT

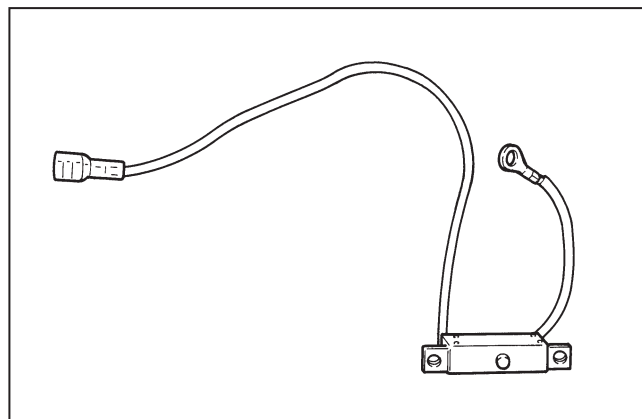
8-4-1 CHECK THE AC OUTPUT.

Check the generator by following Step 8-1-1 through Step 8-1-2.

8-4-2 CHECK THE DC BREAKER.

If the DC breaker turned off while charging a battery, check the cables for short-circuit or connection in reverse polarity before resetting it on.

NOTE : If the DC output is used to charge a large capacity battery or an over-discharged battery, an excessive current may flow causing.



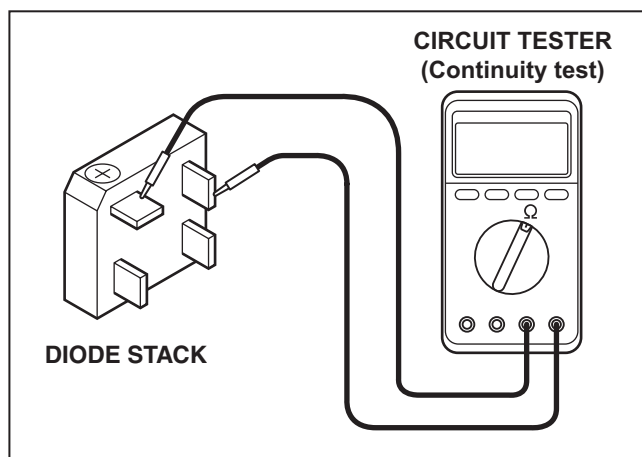
8-4-3 CHECK THE WIRING.

Check all the wires to be connected correctly.

8-4-4 CHECK THE DIODE STACK.

Remove the end cover and check the diode stack with a circuit tester.

Refer to Section 6-7 “DIODE STACK” for the checking procedure.



8-4-5 CHECK THE DC COIL

Check the resistance between two Brown leads from stator with a circuit tester.

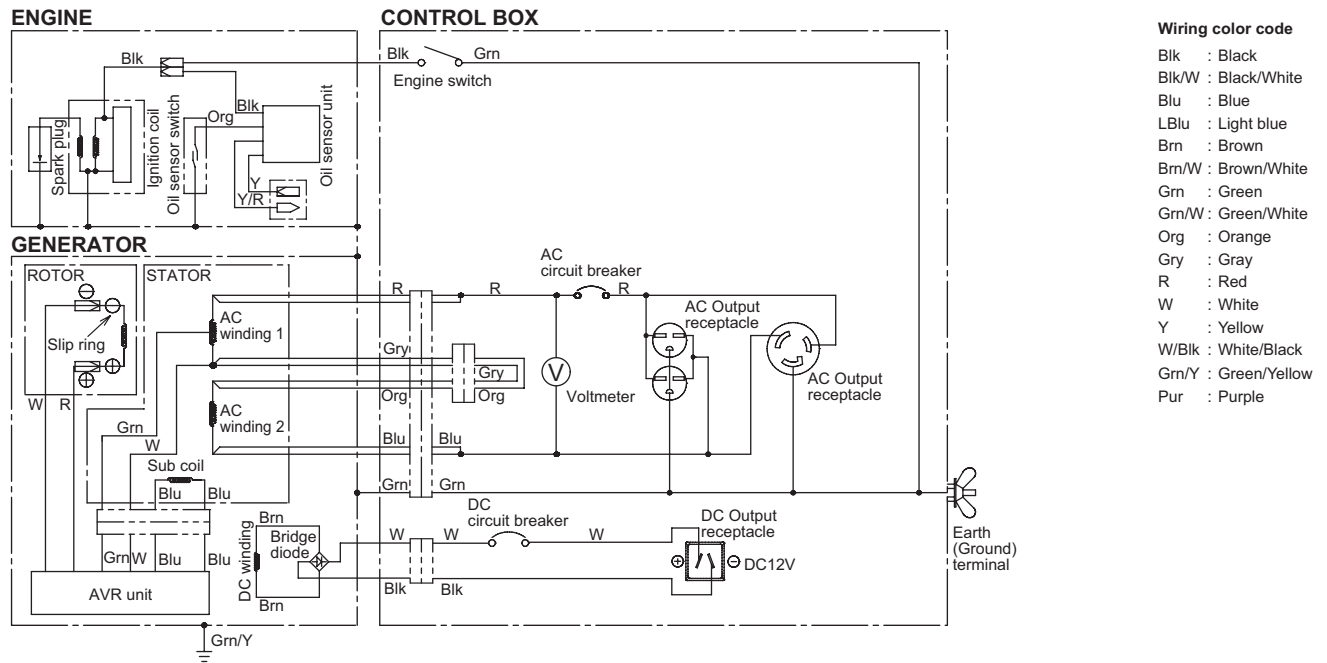
If the resistance reading is much larger or smaller than the specified value, the DC coil of the stator is faulty. Replace stator with a new one.

(Ω)

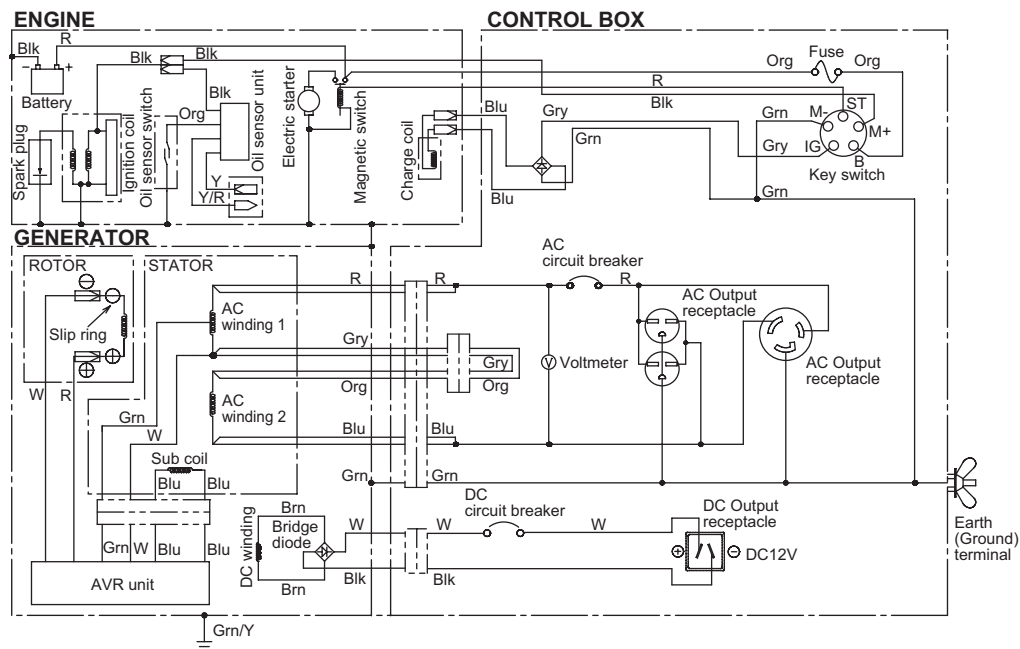
FREQUENCY	50Hz		60Hz
RATED VOLTAGE	220V	240V	120/240V
RGX7100	49.0	49.0	49.0
RGX7800	55.0	55.0	55.0

9. WIRING DIAGRAM

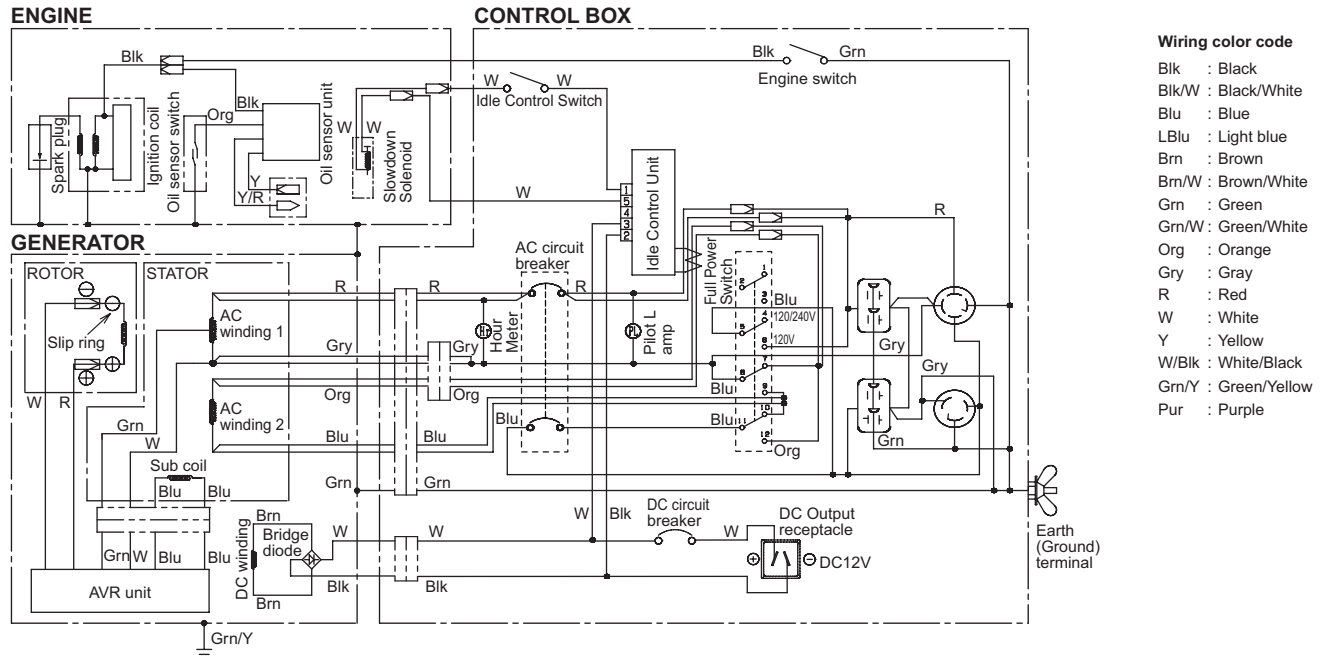
RGX7100 / RGX7800 (50Hz-220V,240V) [Recoil Starter Model]



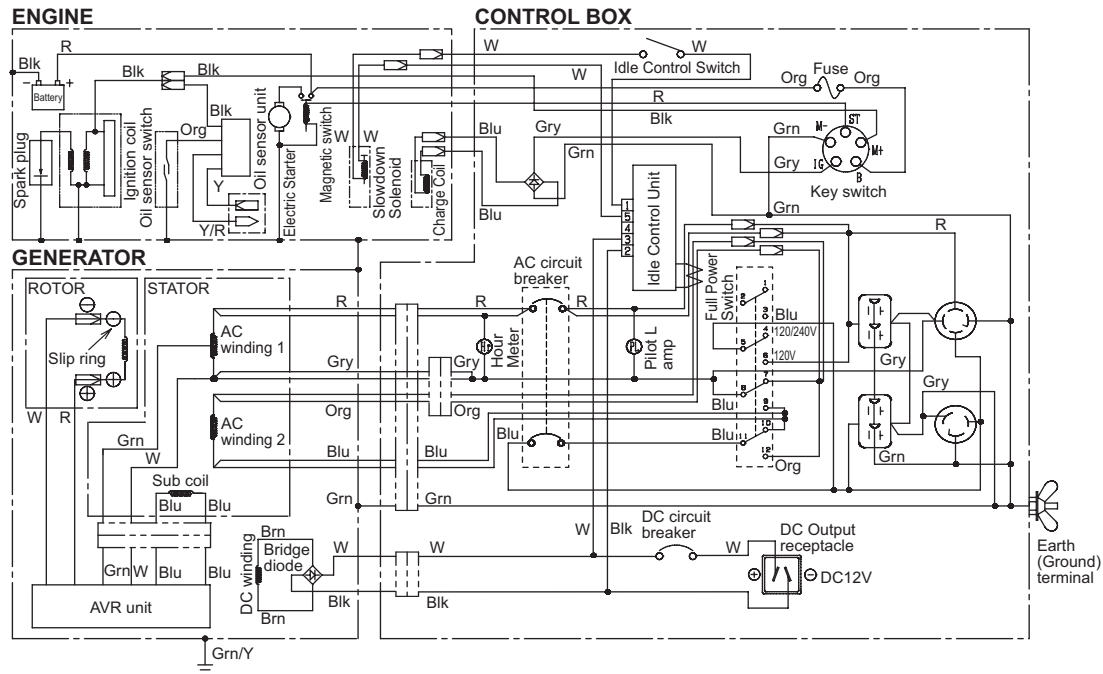
RGX7100 / RGX7800 (50Hz-220V,240V) [Electric Starter Model]



RGX7100 / RGX7800 (60Hz-120/240V) [Recoil Starter Model]



RGX7100 / RGX7800 (60Hz-120/240V) [Electric Starter Model]



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